TENDER SPECIFICATIONS

E- TENDER SPECIFICATION NUMBER: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096

FOR

Electrical/C&I Work for FGD Package of Stage I (3X200MW) + Stage -III (1X500MW) for Korba FGD Project.

VOLUME I – TECHNICAL BID

THIS TENDER SPECIFICATION CONSISTS OF:

Notice Inviting Tender	
Volume-IA	Technical Conditions of Contract
Volume-IB	Special conditions of Contract
Volume-IC	General conditions of Contract
Volume-ID	Forms & Procedures
~~Volume-IE~~	~~Additional Annexures~~
Volume II	Price Bid

Bharat Heavy Electricals Limited

(*A Government of India Undertaking*)
Power Sector – Western Region
345-Kingsway, Nagpur-440001

CONTENTS		
Volume No	Description	Hosted in website bhel.com (Briefly) and detailed in BHEL e-Procurement Portal as files titled
NIL	Tender Specification Issue Details	(Part of **Vol-IA-3096**)
NIL	Notice Inviting Tender	(Part of **Vol-IA-3096**)
I-A	Technical Conditions of Contract	Vol-I-A-3096
I-B	Special Conditions of Contract	Vol-I-BCD-3096
I-C	General Conditions of Contract	(Part of Vol-I-BCD-3096)
I-D	Forms & Procedures	(Part of Vol-I-BCD-3096)
~~I-E~~	~~Technical Specification & Drawing~~	~~Vol-IE-3096~~
II	Price Bid Specification as specified in E-Procurement Portal	Volume-II-3096

E-T E N D E R S P E C I F I C A T I O N S

E- TENDER SPECIFICATION NUMBER: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096

FOR

Electrical/C&I Work for FGD Package of Stage I (3X200MW) + Stage -III (1X500MW) for Korba FGD Project

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION: Refer Notice Inviting Tender

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:

M/s. .....
.....

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

GM (Purchase)
Place: Nagpur
Dae:

Date: 26-03-2025

==========

NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES

==========

To,

Dear Sir/Madam,

Sub : NOTICE INVITING E-TENDER

Sealed offers in two part bid system (National competitive bidding (NCB) ~~or International Co07/11mpetitive Bidding (ICB~~ are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-1) through E-Procurement Portal https://eprocurebhel.co.in only, for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 **Salient Features of NIT**

S No.	ISSUE	DESCRIPTION	
i	TENDER NUMBER	BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096	
ii	Broad Scope of job	Electrical/C&I Work for FGD Package of Stage I (3X200MW) + Stage - III (1X500MW) for Korba FGD Project	
iii	DETAILS OF TENDER DOCUMENT		
A	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc.*	*Applicable*
B	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
C	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
D	Volume-ID	*Forms and Procedures*	*Applicable*
E	~~Volume-IE~~	~~*Drawing and Plot Plan*~~	~~*Applicable*~~
	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	Issue of Tender Documents	Tender documents will be available for downloading from BHEL website (www.bhel.com) or e-procurement portal (https://eprocurebhel.co.in) as per schedule below: *Start: 26/03/2025, Time :13:00 Hrs* *Closes: 16/04/2025, Time: 13:00 Hrs* Brief information of the tenders shall also be available at central public procurement portal. (*https://eprocure.gov.in/epublish/app*)	*Applicable*
v	DUE DATE & TIME OF OFFER SUBMISSION	*Date: 16/04/2025, Time :13:00 Hrs* The bidder should submit their offer online only in e-Procurement portal at https://eprocurebhel.co.in	*Applicable*

S No.	ISSUE	DESCRIPTION	
		Bidders are requested to upload their offer well in advance in order to avoid last minute congestion at this website. Hard copy bid or bids through E-mail / fax shall not be accepted.	
vi	OPENING OF TENDER (Techno-Commercial Bid)	*Date: 16/04/2025, Time: 17:00 Hrs* *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender. For e-Tender, Bidder may witness the opening of tender through e-Procurement portal only.*	*Applicable*
vii	EMD AMOUNT	***Rs 2,00,000 (India Rupees Two Lakhs Only)*** ***Important Note: Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC.***	*Applicable*
viii	COST OF TENDER	*NIL*	*Not Applicable*
ix	LAST DATE FOR SEEKING CLARIFICATION	**One day before due date of offer submission.** Along with soft version also, addressing to undersigned & to others as per contact address given below: 1) Name: Varun Vaidya Designation: Manager Deptt: Purchase Address: Floor no. 5 & 6,Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Mobile9792334127 Emailvvaidya@bhel.in 2) Mr. Dipesh Palit Designation: GM Deptt: Purchase Address: Floor no. 5 & 6,Shree Mohini Complex, 345 Kingsway, Nagpur-440001 Email: dipeshpalit@bhel.in Mob:	*Applicable*
x	SCHEDULE OF Pre Bid Discussion (PBD)	---	***Not Applicable***
xi	INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)	*1) Shri Otem Dai, IAS (Retd.)* *2) Shri Bishwamitra Pandey, IRAS (Retd.)* *3) Shri Mukesh Mittal, IRS (Retd.)*	***Not Applicable***

S No.	ISSUE	DESCRIPTION	
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com–>Tender Notifications →View Corrigendum), Central Public Procurement portal (https://eprocure.gov.in/epublish/app) & on e-tender portal https://eprocurebhel.co.in **and not in the newspapers**. Bidders to keep themselves updated with all such information.	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed digitally using Class III DSC & uploaded in E-Procurement Portal, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Not Used

4.0 Unless specifically stated otherwise, bidder shall deposit EMD as per clause 1.9 of General Conditions of Contract.

For Electronic Fund Transfer the details are as below-:

NAME OF THE BENEFICIARY	BHARAT HEAVY ELECTRICALS LTD
ADDRESS OF THE COMPANY	5th Floor, SHREE MOHINI COMPLEX 345, KINGSWAY,NAGPUR
NAME OF BANK	STATE BANK OF INDIA
NAME OF BANK BRANCH AND BRANCH CODE	SBI,NAGPUR MAIN BRANCH ,CODE-00432
CITY	NAGPUR
ACCOUNT NUMBER	40227423158
ACCOUNT TYPE	MC-C C Clean (C&I)
IFSC CODE OF THE BENEFICIARY BANK BRANCH	SBIN0000432
MICR CODE OF THE BANK BRANCH	440002002

(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.

(Note -: In case of E-Tenders, proof of remittance of EMD should be uploaded in the E-Procurement Portal and originals, as applicable, shall be sent to the officer inviting tender within a reasonable time, failing which the offer is liable to be rejected.

5.0 Procedure for Submission of Tenders:

This is an E-tender floated online through our E-Procurement Site (https://eprocurebhel.co.in). The bidder should respond by submitting their offer online only in our e-Procurement platform at (https://eprocurebhel.co.in). Offers are invited in two-parts only.

Documents Comprising the e-Tender

The tender shall be submitted online ONLY EXCEPT EMD (in physical form) as mentioned below:

a. Technical Tender (UN priced Tender)

All Technical details (e.g. Eligibility Criteria requested (as mentioned below)) should be attached in e-tendering module, failing which the tender stands invalid & may be REJECTED. Bidders shall furnish the following information along with technical tender (preferably in pdf format):

i. Earnest Money Deposit (EMD) furnished in accordance with NIT Clause 4.0. ~~Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT.~~
ii. Technical Bid (without indicating any prices).

b. Price Bid:

i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
ii. The price should be quoted for the accounting unit indicated in the e-tender document.

Note:

- It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.
- A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.
- A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

DO NOT'S

Bidders are requested NOT to submit the hard copy of the Bid. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, the same shall not be considered. **Also, uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender**.

Digital Signing of e-Tender

Tenders shall be uploaded with all relevant PDF/zip format. The relevant tender documents should be uploaded by an authorized person having Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION digital signature certificate (DSC).

The Requirement:

1. A PC with Internet connectivity &
2. DSC (Digital Signature Certificate) (**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**)

BHEL has finalized the e-procurement service Provider-:
NIC PORTAL (https://eprocurebhel.co.in)

For E-PROCUREMENT ASSISTANCE & TRAINING, NIC PORTAL HELPDESK CONTACTS AS PER FOLLOWING:

For any technical related queries, please call at 24 x 7 Help Desk Number
0120-4001 002

0120-4200 462
0120-4001 005
0120-6277 787
1. Peter Raj, NIC, Ph: 9942069052
Email Support: support-eproc@nic.in
Other details/update yourself from : https://eprocurebhel.co.in

The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

The contact details of the DSC certifying authority:-
please refer http://www.mca.gov.in/ →MCA SERVICES → DSC SERVICES

Vendors are requested to go through seller manual available on https://eprocurebhel.co.in.

~~**Procedure for Submission of Tenders (To be used in case of Paper bid only):** The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:~~

- ~~PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD)' in two separate sealed and superscribed envelopes (ENVELOPE I & ENVELOPE II)~~
- ~~PART II (Price Bid) in sealed and superscribed envelope (ENVELOPE III)~~

~~One set of tender documents shall be retained by the bidder for their reference~~

6.0 ~~The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. (All pages to be signed and stamped) (To be used in case of Paper bid only):~~

~~Sl. no.~~	~~Description~~	~~Remarks~~
	~~Part-I A~~	
	~~ENVELOPE – I superscribed as:~~ ~~PART-I (TECHNO COMMERCIAL BID)~~ ~~TENDER NO :~~ ~~NAME OF WORK :~~ ~~PROJECT:~~ ~~DUE DATE OF SUBMISSION:~~ ~~CONTAINING THE FOLLOWING:~~	
~~i.~~	~~Covering letter/Offer forwarding letter of Tenderer.~~	
~~ii.~~	~~Duly filled in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above.~~ ~~Note:~~ ~~a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained.~~ ~~b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding.~~ ~~i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL~~	

	ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii.	Supporting documents/ annexure/ schedules/ drawing etc. as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph. no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc. pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc. as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc.	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

	PART I B	
	ENVELOPE – II superscribed as: PART I (EMD) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING:-**	
	Earnest Money Deposit (EMD) in the form as indicated in this Tender	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE III superscribed as: PART II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
I	Covering letter/Offer forwarding letter of Tenderer enclosed in Part I	
ii	Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	~~OUTER COVER~~	
	~~ENVELOPE IV (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as:~~ ~~TECHNO-COMMERCIAL BID, PRICE BID & EMD~~ ~~TENDER NO:~~ ~~NAME OF WORK:~~ ~~PROJECT:~~ ~~DUE DATE OF SUBMISSION:~~ ~~CONTAINING THE FOLLOWING:~~	
~~I~~	~~o Envelopes I~~ ~~o Envelopes II~~ ~~o Envelopes III~~	

- SPECIAL NOTE: All documents/ annexures to be submitted should be uploaded in respective places in the E-Tender portal as per the list mentioned given in this NIT. BHEL shall not be responsible for any in-complete documents.

7.0 Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 PERFORMANCE OF BIDDERS:

- 'Monthly Performance' of the bidder for all the package covered under the tendered scope shall be captured for the packages Under execution'. (refer Table-1)
- The monthly performance rating, shall be calculated as per Online Systems i.e. Contractor Performance Evaluation System (CPES) and Safety Performance Evaluation System (HSEPES). The scores assigned in HSEPES shall be scaled down to 10 and assigned in CPES against the category "HSE" (mentioned in Form F-15).
- Explanatory note:
  - Identified Packages (Unit wise) Table-1

Civil	Electrical and C&I	Mechanical
i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	i). Electrical ii). C&I iii). Others (Elect. and C&I) iv). Electrical Enabling Works	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). ESP iv). LP Piping v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Management x). FGD xi). ACC

		xii). Others (Mechanical)

- 'Under execution' shall mean works in progress as per the following:
  (a) Up to execution of 90% of anticipated Contract Value in case of Civil, MM, Structural and Turbo Blower Packages
  (b) Up to Steam Blowing in case of Boiler/ESP/Piping Packages
  (c) Up to Synchronization in all Balance Packages

  Note: BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (a), (b) and (c) above, depending upon the balance scope of work to be completed.

- Contractor shall provide the latest contact details i.e. mail-ID and Correspondence Address to SCT Department, so that same can be entered in the Contractor Performance Evaluation System, and in case of any change/discrepancy same shall be informed immediately. Login Details for viewing scores in Contractor Performance Evaluation System shall be provided to the Contractor by SCT Department.

- Performance Evaluation for Activity Month shall be completed in Evaluation Month (i.e. month next to Activity Month) or in rare cases in Post Evaluation Month (i.e. month next to Evaluation Month) after approval from Competent Authority. In case scores are not acceptable, Contractor can submit Review Request to GM Site/ GM Project latest by 27th of Evaluation Month or 5 days after approval of score, whichever is later. However, acceptance/rejection of 'Review Request' solely depends on the discretion of GM Site/GM Project. After acceptance of Review Request, evaluation score shall be reviewed at site and the score after completion of review process shall be acceptable and binding on the contractor.

- Project on Hold due to reasons not attributable to bidder -
  - **Short hold:** Evaluation shall not be applicable for this period.
  - **Long hold:** Short hold for continuous six months and beyond or hold on account of Force Majeure shall be considered as Long Hold. Evaluation shall not be considered for this period.

Performance evaluation as specified above in this clause is applicable to Prime bidder and Consortium partner (or Technical tie up partner) for their respective scope of work

10.0 Since the job shall be executed at site, bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc. before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail and/or through e-procurement portal https://eprocurebhel.co.in, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be

decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc. or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (1) above.**

"Integrity Pact (IP)"

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl. No.	IEM	Email
1.	*Shri Otem Dai, IAS (Retd.)*	iem1@bhel.in
2.	*Shri Bishwamitra Pandey, IRAS (Retd.)*	Iem2@bhel.in
3.	*Shri Mukesh Mittal, IRS (Retd.)*	Iem3@bhel.in

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

Name:	Dipesh Palit/ GM (Purchase)	Varun Vaidya/Manager (Purchase)
Dept:	Purchase Department	
Address:	Floor No. 5 & 6, Shreemohini Complex, 345 Kingsway, Nagpur-440001	

Email:	pkbiswas@bhel.in	vvaidya@bhel.in
Phone:		0712-2858600 – Ext-715

16.0 The Bidder has to satisfy the Pre-Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of satisfying the Pre-Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorized representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise.

19.0 **Reverse Auction:** "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) (https://www.bhel.com/guidelines-reverse-auction-20214) for this tender. RA shall be conducted among the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

Note:-

1. No benefits to MSE bidders w.r.t Reverse Auction Guidelines as available on www.bhel.com against works contract.
2. In case of enquiry through e-procurement the sealed electronic price bid (e-bid) is to be treated as sealed envelope price bid.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre-Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:

23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement for the said contract with a validity period of six months initially. In case bidder becomes L1, Consortium Agreement valid till contractual completion period shall be submitted to BHEL before signing the contract. Consortium Agreement shall be kept valid till scope of work awarded to consortium partner(s) as per contract is completed.

23.2 'Standalone' bidder cannot become a '**Prime Bidder' or a 'Consortium bidder' or 'Technical Tie up bidder' in a consortium (or Technical Tie up) bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner

may enter into consortium agreement with other prime bidders. In case of non-compliance, consortium bids of such Prime bidders will be rejected.

23.3 Number of partners for a Consortium Bidding (or Technical Tie up) including Prime Bidder shall be NOT more than 3 (three).

23.4 Prime Bidder shall be as specified in the Pre-Qualification Requirement, else the bidder who has the major share of work.

23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder' as specified in clause 9.0.

23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'.

23.7 Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified

23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.

23.9 Prime Bidder shall be responsible for the overall execution of the contract.

23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats.

23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL and BHEL shall take necessary action as per extant guidelines. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.

23.12 In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL.

23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of one work with a consortium partner under direct order of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.

23.14 The consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. In case there are two consortium partners, then each partner shall submit SD equivalent to 0.5% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value. However, Prime Bidder has also option for submission of SD on behalf of consortium partner (s).

SD submitted by Consortium Partner(s) may be released in case corresponding scope of work of the respective Consortium partner(s) has been completed upto the extent of 80% based on certification by Construction Manager and concurrence by the prime bidder.

23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also..

24.0 The bidder shall submit/upload documents in support of possession of 'Qualifying Requirements' duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 The consultant / firm (and any of its affiliates) shall not be eligible to participate in tender(s) for the related works or services for the same project, if they were engaged for the consultancy services.

27.0 Guidelines/rules in respect of Suspension of Business dealings, Vendor evaluation format, Quality, Safety & HSE guidelines, Experience Certificate, etc. may undergo change from time to time and the latest one shall be followed. The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "**supplier registration page**".

28.0 The offers of the bidders who are on the banned/ hold list and also the offer of the bidders, who engage the services of the banned/ hold firms, shall be rejected. The list of **banned/ hold firms** is available on BHEL web site www.bhel.com.

28.1 Integrity commitment, performance of the contract and punitive action thereof:

28.1.1 **Commitment by BHEL:**

BHEL commits to take all measures necessary to prevent corruption in connection with the tender Process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

28.1.2 Commitment by Bidder/ Supplier/ Contractor:

(i) The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

(ii) The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

(iii) The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the prices or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/

contractor as per extent guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

29.0 ~~Micro and Small Enterprises (MSE)~~

~~Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.~~

~~Type under MSE~~	~~SC/ST owned~~	~~Women owned~~	~~Others (excluding SC/ ST & Women Owned)~~
~~Micro~~			
~~Small~~			

~~**Note:** - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.~~

~~*a)* MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration Certificate or EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or Udyog Aadhar Memorandum (UAM) & Acknowledgement or EM-II Certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3) where deemed validity of EM-II certificate of five years has expired applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. Documents submitted by the bidder may be verified by BHEL for rendering the applicable benefits.~~

30.0 The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

31.0 **PREFERENCE TO MAKE IN INDIA:**

For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined I Public Procurement (Preference to Make in India), Order 2017 dated 19-07-2024 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

31.1 Compliance to Restrictions under Rule 144 (xi) of GFR 2017

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means:

a. An entity incorporated established or registered in such a country; or
b. A subsidiary of an entity incorporated established or registered in such a country; or
c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
d. An entity whose beneficial owner is situated in such a country; or
e. An Indian (or other) agent of such an entity; or
f. A natural person who is a citizen of such a country; or
g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

IV. The beneficial owner for the purpose of (III) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.
   Explanation
   a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company.
   b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.
2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.
3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.
4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

Note:

(i) The bidder shall provide undertaking for their compliance to this Clause, in the Format provided in **Annexure-11.**
(ii) Registration of the bidder with Competent Authority should be valid at the time of submission as well as acceptance of the bids.

32.0 Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.
All overwriting/cutting, etc., will be numbered by bid opening officials and announced during bid opening.

33.0 In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.

In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/ draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).

Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

34.0 The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

35.0 Order of Precedence:
In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

It may please be noted that guidelines/ circulars/ amendments/ govt. directives issued from time to time shall also be applicable.

For BHARAT HEAVY ELECTRICALS LTD

(General Manager - Purchase)

Enclosure:

1.0 **Annexure-1**: Pre Qualifying Requirements.
2.0 **Annexure-2**: Check List.
~~3.0 **Annexure-3**: Certificate by Chartered Accountant~~
4.0 **Annexure-4**: Reverse Auction Process Compliance Form
5.0 **Annexure-5**: Authorization of representative who will participate in the online Reverse Auction Process
6.0 **Annexure-6**: RA Price Confirmation and Breakup
7.0 **Annexure-7**: Integrity Pact
8.0 **Annexure-8**: Undertaking as per PQR C4 of Annexure-1 i.e. PQR
9.0 **Annexure-9**: Declaration reg. Related Firms & their areas of Activities
10.0 **Annexure-10**: Declaration regarding minimum local content
11.0 **Annexure-11**: Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017
12.0 **Annexure 12**: Important information.

ANNEXURE - 1

PRE QUALIFYING CRITERIA

E-Tender Spec No: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096			
JOB	Electrical/C&I Work for FGD Package of Stage I (3X200MW) + Stage -III (1X500MW) for Korba FGD Project.		
S No	PRE QUALIFICATION CRITERIA	~~Bidders claim in respect of fulfilling the PQR Criteria~~ Applicability	
A	**Submission of Integrity Pact duly signed (if applicable)** (Note: To be submitted by Prime Bidder & Consortium /Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	NOT APPLICABLE	
B	B) Technical PQR Bidder shall essentially meet all the Qualifying Requirements (i.e. B.1 & B.2 & B.3) as under: B.1) Bidder should have Executed "**Electrical or C&I or Electrical and C&I works**" for any one of the following in the last seven years from latest date of bid submission: **B.1.1)** Executed One work of value not less than **Rs 132.00 Lakhs** against single work order. **OR** **B.1.2)** Executed Two works each of value not less than **Rs 82.5 Lakhs** against maximum two work orders. **OR** **B.1.3)** Executed Three works each of value not less than **Rs 66 Lakhs** against maximum three work orders. **AND** B.2) B.2.1: Bidder should have Executed Electrical Works consisting of following: a. Power Transformers (at least 12 MVA Rating of Transformer) b. LT/HT Switchgear **AND** B.3) Bidder should have Executed any of the following: **B.3.1)** "C&I works for BTG/GT/Power Plant/any Industry" or "C&I works consisting of DCS/DDC/Station C&I". **OR** **B.3.2)** One Contract of C&I works consisting of DCS/DDC/Station C&I in any industry.	APPLICABLE	

	Note: Bidder should satisfy PQR B.1, B.2 and B.3 as a standalone bidder. In case a bidder does not satisfy PQR B.3 above, then the bidder can form consortium with one party who satisfies the PQR B.3 above. This will be termed as "**Consortium Bidding**". In case of consortium bidding, following shall be applicable: • Prime bidder should satisfy PQR B.1 and B.2 above. • Agency satisfying PQR B.3 shall be termed as "**Consortium Partner**". • Prime bidder shall be responsible for satisfying the financial PQR-C (i.e. C-1, C-2, C-3 & C.4). • Prime bidder shall submit the entire tender along with the credentials, all statutory documents and the documents in support of PQR condition of the Consortium Partner. All conditions as in Clause 23 of NIT shall also be applicable for consortium bidding		
C-1	Financial TURNOVER Bidders must have achieved an average annual financial turnover (audited) of **Rs. 49.50 Lakhs** or more over last three Financial Years (FY) i.e. **2021-22, 2022-23 & 2023-24.**	**APPLICABLE**	
C-2	NETWORTH (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive.	**APPLICABLE**	
C-3	PROFIT Bidder must have earned profit in any one of the **five** Financial Years as applicable in the last five Financial Years (i.e. 2019-2020, 2020-2021, 2021-2022, 2022-2023 & 2023-2024). Bidders to submit audited balance sheets and profit & loss statements for the years as supporting documents.	**APPLICABLE**	
C-4	Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.	**APPLICABLE**	
D	**Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)** The "Assessment of Capacity of Bidders" for this Tender shall be carried out by considering the identified packages i.e. **"ELECTRICALS" & "C&I".**	**NOT APPLICABLE**	**BY BHEL**
E	**Approval of Customer (if applicable)** **Note:** Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval	**APPLICABLE**	**BY BHEL**
F	Price Bid Opening **Note:** Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E		**BY BHEL**
G	Consortium tie-ups	**APPLICABLE**	

Explanatory Notes for the PQR (unless otherwise specified in the PQR):

Explanatory Notes for PQR B.1 (Technical)

- For the criteria (B.1), actual executed value shall be considered.
- Value of work is to be updated with indices for "All India Avg. Consumer Price index for industrial workers" and "Monthly Whole Sale Price Index for All Commodities" with base month as per last month of work execution and indexed up to three (3) months prior to the month of latest due date of bid submission as per following formula-

$$P = R + 0.425 \times R \times \frac{(X_N - X_0)}{X_0} + 0.425 \times R \times \frac{(Y_N - Y_0)}{Y_0}$$

Where
P = Updated value of work
R = Value of executed work
X_N = All India Avg. Consumer Price index for industrial workers for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
X_0 = All India Avg. Consumer Price index for industrial workers for last month of work execution
Y_N = Monthly Whole Sale Price Index for All Commodities for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
Y_0 = Monthly Whole Sale Price Index for All Commodities for last month of work execution

- The evaluation currency for this tender shall be INR.

Explanatory Notes for Technical Criteria (B2):

1. VOID
2. Unless otherwise specified, for the purpose of "B2 Technical Criteria", the word 'EXECUTED' means achievement of milestones as defined below -
    a. "ACHIEVEMENT OF PHYSICAL QUANTITIES" as per PQRs.
    b. "READINESS FOR COAL FILLING" of at least one Bunker, in respect of Mill Bunker Structure.
    c. "CHARGING" in respect of Power Transformers/ Bus Ducts/ "HT/LT Switchgears" / "HT/LT Cabling".
    d. For C&I works: "SYNCHRONISATION" in case of power project / "WORK EXECUTION of the value as defined in PQR" in case of industry.
    e. "BOILER LIGHT UP" in respect of Boiler / CFBC / ESP.
    f. "CHARGING OF ATLEAST ONE PASS" in respect of ESP(R&M)
    g. "GAS IN" in respect of HRSG.
    h. "STEAM BLOWING" in respect of Power Cycle Piping.
    i. "HYDRAULIC TEST"/ ANY OTHER EQUIVALENT TEST LIKE "100% RT/UT OF WELDED JOINTS" of the system in respect of Pressure parts/ LP Piping/CW Piping.
    j. "FULL LOAD OPERATION OF THE UNIT" in respect of Insulation work.
    k. "SYNCHRONISATION" in respect of STG / GTG.
    l. "SPINNING" in respect of HTG.
    m. "GAS IN" in respect of FGD
3. Boiler means HRSG or WHRB or any other types of Steam Generator.

4. Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass.
5. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5 TPH where ever rating of HRSG/BOILER is mentioned in MW. Similarly, where ever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating of the same in terms of MW shall be considered for evaluation.

Explanatory Notes for PQR -C (Financial):

C-1:

i. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above.
ii. Evaluation of Turnover criteria shall be calculated from the Audited Balance Sheet and Profit & Loss Account for the three Financial Years (FY).
iii. In case audited Financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years.
iv. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.

C-2: Net Worth (Only in case of companies) of the bidder should be positive.

Note: Net worth shall be calculated based on the latest Audited Accounts as furnished for 'C-1' above.

Net worth = Paid up share capital + Reserves

C-3: Bidder must have earned profit in any one of the last five financial years as applicable in the last five financial years as furnished for 'C-1' above.

Note: PROFIT shall be PBT earned during any one year of last five financial years as in 'C-1' above.

C-4: Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.

Common Explanatory Notes:

1. For evaluation of PQR, in case Bidder alone does not meet the pre-qualifying technical criteria B1 above, bidder may utilize the experience of its Parent/ Subsidiary Company along with its own experience, subject to following:
   a. The parent company shall have a controlling stake of ≥50% in the subsidiary company (as per Format-1).
   b. The Parent Company/ Subsidiary Company of which experience is being utilized for bidding shall submit Security Deposit(SD) equivalent to 1% of the total contract value
   c. The parent/ subsidiary company and bidder shall provide an undertaking that they are jointly or severally responsible for successful performance of the contract (as per Format-2).
   d. In case Bidder is submitting bid as a Consortium Partner, option of utilizing experience of parent/subsidiary Company can be availed by Prime Bidder only.
   e. Parent Company/ Subsidiary Company of which experience is being used for bidding, cannot participate as a 'Standalone Bidder' or as a 'Consortium bidder'.
2. Completion date for achievement of the technical criteria specified in the 'B' above should be in the last 7 years ending on the 'latest date of Bid Submission' of Tender irrespective of date of the start of work. Completion date shall be reckoned from the " Financial Year quarter of bid submission". (for e.g. -Work completed on 01.01.2014 shall be considered even if latest date of bid submission is 20.03.2021).

3. "Executed" means the bidder should have achieved the technical criteria specified in the Common QR even if the Contract has not been completed or closed.
4. In case the Experience/PO/WO certificate enclosed by bidders do not have separate break up of prices for the E&C portion for Electrical and C&I works (i.e. the certificates enclosed are for composite order for supply and erection of Electrical and C&I and other works if any), then value of Erection & Commissioning for the Electrical and C&I portion shall be considered as 15% of the price for supply & erection of Electrical and C&I.
5. Following shall be complied with in case of consortium:
   a. The Prime Bidder and Consortium Partner(s) are required to enter in to a consortium agreement and certify to BHEL regarding existence and validity of their consortium agreement in line with validity period mentioned in NIT.
   b. Prime Bidder and Consortium partners shall be approved by Customer for being considered for the tender (applicable if customer approval is required).
   c. Number of partners including prime Bidder shall be NOT more than 3 (three).
   d. Prime Bidder alone shall necessarily comply with "B1Technical Criteria" except for mechanical package where B1 criteria is not applicable.
   e. Prime Bidder and Consortium Partner shall together comply with the 'Pre-Qualification Requirements' specified for the respective category of technical requirement as per "B2 technical criteria".
   f. Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified.
   g. All other conditions shall be read in conjunction with clause no 23.0 of NIT.
   h. Prime Bidder shall be the Bidder who has a major share of work.
   i. Prime Bidder shall be responsible for the overall execution of the Contract.
   j. Performance shall be evaluated for Prime Bidder and the Consortium partner for their respective scope of work.
   k. In case the Consortium partner backs out, another consortium partner meeting the QRs, has to be engaged by Prime Bidder and if not, the respective work will be withdrawn and executed on risk and cost basis of the prime bidder.
   l. In case Prime Bidder withdraws or insolvency / liquidation / winding up proceedings have been initiated / admitted against the Prime Bidder, BHEL reserves the right to cancel, terminate or short close the contract or take any other action to safeguard BHEL's interest in the Project / Contract. This action will be without prejudice to any other action that BHEL can take under Law and the Contract to safeguard interests of BHEL
   m. After successful execution of one work with a consortium partner under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.
   ~~n.~~ The Consortium partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the Prime Bidder for the total contract value.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

Credentials submitted by the bidder against “PRE QUALIFYING CRITERIAS” shall be verified for its authenticity. In case, any credential (s) is/are found unauthentic, offer of the bidder is liable to the rejection. BHEL reserves the right to initiate any further action as per extant guidelines for Suspension of Business Dealings.

Format-1

Certificate for relationship between Parent Company / Subsidiary Company and the bidder

To,
.....

.....

Dear Sir,

Sub: Bid for NIT No .....dated..... for "....." (name of the tender).

We hereby certify that M/s..... is Parent Company/ Subsidiary Company of M/s.....(the bidder) and details of equity holding of the Parent Company in Subsidiary Company as on .....(not earlier than seven days prior to the Bid Submission Date) are given as below:

Name of Parent Company	Name of Subsidiary Company	Percentage of Equity Holding of Parent Company in Subsidiary Company

(Insert Name and Signature of Statutory Auditor or practicing Company Secretary of the Bidder)

Format-2

Undertaking from the Parent Company/ Subsidiary Company of the bidder

(On the Letter Head of Parent Company/ Subsidiary Company, as applicable)

From,
Name:
Full Address:

Telephone No.:
E-mail address:
Fax/No.:

To,
.....
.....

Dear Sir,

We refer to the NIT No ..... dated..... for "....." (name of the Tender).

"We have carefully read and examined in detail the NIT/Tender Terms and Conditions, including in particular, Clause .... of the NIT/Tender, regarding submission of an Undertaking, as per the prescribed Format 1 of the NIT/ Tender.

We confirm that M/s.....(the Bidder) has been authorized by us to use our Technical capability for meeting the Technical Criteria as specified in Clause.....of the PQR of the NIT/Tender referred above.

We agree to submit the Security Deposit equivalent to 1% of the total contract value in addition to Security Deposit to be submitted by Bidder as per Clause.....of the NIT/Tender for fulfillment of all obligations in terms of provisions of the contract, in the event of .....(the Bidder) being selected as the Successful Bidder.

We confirm that we along with M/s.....(the bidder), are jointly or severally responsible for successful performance of the contract.
We confirm that our company shall not participate in the above tender as a 'Standalone Bidder' or as a 'Consortium bidder' and also shall not authorize any other bidder to use our Technical capability for the above tender.

All the terms used herein but not defined, shall have the meaning as ascribed to the said terms under the referred NIT/Tender.

Signature of Managing Director/Authorized signatory of Parent/ Subsidiary Company

ANNEXURE - 2

CHECK LIST

NOTE: - Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ~~ONE TIME EMD /~~ ONLY FOR THIS TENDER	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	**Applicable**	YES / NO
7	Audited profit and Loss Account for the last three years	**Applicable**/~~Not Applicable~~	YES/NO
8	Copy of GST & PAN Card	**Applicable**/~~Not Applicable~~	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc. are read understood and signed	**Applicable**/~~Not Applicable~~	YES/NO
10	Integrity Pact	**Applicable**~~/Not Applicable~~	YES/NO
11	OFFER FORWARDING LETTER / TENDER SUBMISSION LETTER	**Applicable**/~~Not Applicable~~	YES/NO
12	Declaration by Authorized Signatory	**Applicable**/~~Not Applicable~~	YES/NO
13	No Deviation Certificate	**Applicable**/~~Not Applicable~~	YES/NO
14	Declaration confirming knowledge about Site Conditions	**Applicable**/~~Not Applicable~~	YES/NO

15	Declaration for relation in BHEL	**Applicable**/~~Not Applicable~~	YES/NO
16	Non-Disclosure Certificate	**Applicable**/~~Not Applicable~~	YES/NO
17	Bank Account Details for E-Payment	**Applicable**/~~Not Applicable~~	YES/NO
18	Capacity Evaluation of Bidder for current Tender	**Applicable**/~~Not Applicable~~	YES/NO
19	Tie Ups/Consortium Agreement are submitted as per format	**Applicable**/~~Not Applicable~~	YES/ NO
20	Power of Attorney for Submission of Tender/Signing Contract Agreement Power of Attorney of Consortium Partner.	**Applicable**/~~Not Applicable~~	YES/NO
21	Analysis of Unit rates	**Applicable**/~~Not Applicable~~	YES/NO
22	Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process	**Applicable**/~~Not Applicable~~	YES/NO
23	Annexure-6: RA Price Confirmation and Breakup	**Applicable**/~~Not Applicable~~	YES/NO
24	Annexure-8: Undertaking as per PQR C4 of Annexure-1 i.e. PQR	Applicable/~~Not Applicable~~	YES/NO
25	Annexure-9: Declaration reg. Related Firms & their areas of Activities (x) Other Tender documents as per this NIT.	**Applicable**/~~Not Applicable~~	YES/NO
26	Annexure-10 Declaration regarding minimum local content	**Applicable**/~~Not Applicable~~	YES/NO
27	Annexure-11: Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017	**Applicable**/~~Not Applicable~~	YES/NO

NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY

(With Name, Designation and Company seal)

ANNEXURE-3

Certificate by Chartered Accountant on letter head

(applicable upto 31st March'2021 in line with MSME notification no. S.O. 2119 (E), dated 26th June'2020)

This is to Certify that M/S ....., (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part II)/ Udyam Registration Certificate No. ..... dtd: ....., Category: ..... (Micro/Small/Medium)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No. S.O.1722(E) dated October 5, 2006:
   Rs.....Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the **MSMED** Act, 2006:
   Rs.....Lacs

3. **For Enterprises** (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum): Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. ..... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)

4. **For Enterprises** (having EM-II Certificate/ valid NSIC Certificate or Udyog Aadhar Memorandum): Investment in plant and machinery or equipment is Rs..... Lacs and turnover is Rs. ..... Lacs (as notified in MSME notification no. S.O. 2119 (E) dated 26.06.2020)

(Strike off whichever is not applicable)

The above investment of Rs..... ..... Lacs is within permissible limit of Rs..... Lacs for ..... Micro / Small/ Medium *(Strike off which is not applicable)* Category under MSMED Act 2006.

Or

The enterprise has been graduated upward from its original category (micro/small/medium) (*strike off which is not applicable*), the enterprise shall maintain its prevailing status till expiry of one year from the close of year of registration, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.

Or

The enterprise has been reverse graduated from its original category (micro/small/medium) (*strike off which is not applicable*), the enterprise will continue in its present category till the closure of the financial year and it will be given the benefit of the changed status only with effect from 1st April of the financial year following the year in which such change took place, as notified vide S.O. No. 2119 (E) dated 26.06.2020 published in the gazette notification dated 26.06.2020 by Ministry of MSME.

Date:
(Signature)
Name:
Membership Number:

Seal of the Chartered Accountant

ANNEXURE-4

Reverse Auction Process Compliance Form

(The bidders are required to print this on their company's letterhead and sign, stamp before RA)

To

- M/s. {*Service provider*
- *Postal address}*

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no. { BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096 } dt. {.....}
This letter is to confirm that:

1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.

2) We have studied the Reverse Auction guidelines (as available on www.bhel.com), and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.

3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.

4) We also confirm that, in case we become L1 bidder, we will FAX/ email the price confirmation & break up of our quoted price as per *Annexure - 6* within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {*Service provider.}*

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal

Name:
Company / Organization:
Designation within Company / Organization:
Address of Company / Organization:

Sign this document and FAX/ email it to M/s *{Service provider}* at *{.....}* prior to start of the Event

ANNEXURE-5

Authorization of representative who will participate in the on line Reverse Auction Process:

1	NAME OF THE BIDDER	
2	NAME & DESIGNATION OF OFFICIAL	
3	POSTAL ADDRESS (COMPLETE)	
4	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

ANNEXURE-6

Reverse Auction price confirmation and breakup

(To be submitted by L1 bidder after completion of Reverse Auction)

To

- M/s. *Service provider*
- *Postal address*

CC: M/s BHEL
BHEL-PSWR, 345, KINGSWAY, NAGPUR-440001

Sub: **Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

Rs.{____in value & in words_____} for item(s) covered under tender enquiry No. { BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096**} dt.{...}**

Total price of the items covered under above cited enquiries is inclusive of {*Packing & forwarding, GST, E.D., C.S.T., freight and insurance charges up to {.....} District,{.....} State and Type Test Charges etc., (exclusive of service tax), other as per NIT*}

as our final landed prices as quoted during the Reverse Auction conducted today {*date*} which will be valid for a period of {___ **in nos. & in words** ___} days.

The price break-up is as given below.

========

Total - Rs. **in value & in words**

========

Yours sincerely,

For _____

Name:
Company:
Date:
Seal:

ANNEXURE-7

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi -110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for **E-Tender Spec No: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096** (**Job Description**: Electrical/C&I Work for FGD Package of Stage I (3X200MW) + Stage -III (1X500MW) for Korba FGD Project.)

(hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).
In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1-Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 -Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the

tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 -Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 -Compensation for Damages

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 -Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 -Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 -Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a

complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity; they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 -Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the

final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 -Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal	For & On behalf of the Bidder/ Contractor
(Office Seal)	(Office Seal)

Place----------

Date----------

Witness: _____ Witness: _____

(Name & Address) _____ (Name & Address) _____

_____ _____

ANNEXURE – 8

UNDERTAKING

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder)

To,

GM-PURCHASE, BHEL-PSWR,
Floor No. 5&6, Shri Mohini Complex
345, KINGSWAY, NAGPUR-440001

Dear Sir/Madam,

Sub: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS

Ref: NIT/Tender Specification No: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096

I/We,

_____declare

that, I/We am/are not under insolvency resolution process or liquidation or Bankruptcy Code Proceedings (IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render us ineligible for participation in this tender.

Sign. of the AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

Place:
Date:

ANNEXURE-9

DECLARATION

Date:_____

To

GM-PURCHASE, BHEL-PSWR,
Floor No. 5&6, Shri Mohini Complex
345, KINGSWAY, NAGPUR-440001

Sub: **Details of related firms and their area of activities**

Dear Sir/ Madam,

Please find below details of firms owned by our family members that are doing business/ registered for same item with BHEL,_____ (NA, if not applicable).

1	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
2	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
.....		

Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.

Regards,
(_____)

From: M/s _____
Supplier Code: _____
Address: _____
_____
_____

Annexure-10

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

GM-PURCHASE, BHEL-PSWR,
Floor No. 5&6, Shri Mohini Complex
345, KINGSWAY, NAGPUR-440001

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).

Ref : 1) NIT/Tender Specification No: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by..... *(specify the name of the organization here)* has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:
1. _____ 2. _____
3. _____ 4. _____
...

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

****** - *Strike out whichever is not applicable.*

Note:

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).

In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.)

ANNEXURE-11

DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

GM-PURCHASE, BHEL-PSWR,
Floor No. 5&6, Shri Mohini Complex
345, KINGSWAY, NAGPUR-440001

Dear Sir,

Sub: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

Ref : 1) NIT/Tender Specification No: BHE/PW/PUR/KNFGD-ELE-STG-I & III /3096,
2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. I certify that _____ *(specify the name of the organization here)*,

(a) is not from such a country / ☐
(b) has been registered with the Competent Authority *(attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT))*; ☐

and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. *(attach relevant valid registration, if applicable)*

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,
Yours faithfully,

**(Signature, Date & Seal of
Authorized Signatory of the Bidder)**

Note: Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.

Annexure-12: IMPORTANT INFORMATION

E -Tender for this work is invited by BHEL PSWR NAGPUR and offer shall be submitted through BHEL e-procurement portal only. All correspondences regarding this tender shall be through E-procurement portal.

Postal Address:
GM /Purchase BHEL PSWR,
SRIMOHINI COMPLEX, Floor No. 5 & 6, 345 KINGSWAY, NAGPUR 440001, INDIA

Following are the concerned BHEL officials to whom bidders can contact in case of any difficulty:

Manager Purchase, Email: vaidya@bhel.in Ph: +91-9792334127
Manager Purchase, Email: BIRAJ@bhel.in; Ph+91-9429198214

1. **Refer the abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' which is available at www.bhel.com on "supplier registration page" at the following link:** https://www.bhel.com/sites/default/files/suspension_guidelines_abridged.pdf

2. **All Statutory Requirements as applicable for this project shall be complied with.**
3. **Following clause shall form part of the HSE documents issued under Chapter IX of Volume IB 'Special Conditions of Contract'**

   "In case of any financial deduction made by Customer for lapses of safety other than what is provided elsewhere in the contract, the same shall be charged on back-to-back basis on the defaulting contractor without prejudice to any other right spelt anywhere in the tender /contract"

4. **BHEL Fraud Prevention Policy: "The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice."**

5. **"Pradhan Mantri Kaushal Vikas Yojna:** The contractor shall, at all stages of work deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/Industrial Training Institute/ National Institute of Construction Management and Research (NICMAR), National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/ Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in–Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding".

6. Bidder to strictly follow all the necessary guidelines issued by Customer, District Magistrate, State Government and Central government to control Pandemic/Epidemic outbreak. The related towards quarantine Centre/Medical expenses etc., if any, shall be in the bidder's scope.

7. **The clause 2.7.9.1 below is added under the heading "Rights of BHEL" of General Conditions of Contract Volume-IC GCC:**

2.7.9.1 Provision of Penalty in case of slippage of Intermediate Milestones:

i) **Two major Intermediate Milestones are mentioned as M1 & M2 in Chapter VI: Time Schedule of Vol IA Technical Conditions of Contract.**

ii) In case of slippage of these identified Intermediate Milestones, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to Form 14.

iii) In case delay in achieving M1 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 2% of Executable Contract Value, will be withheld.

iv) In case delay in achieving M2 Milestone is solely attributable to the contractor, 0.5% per week of Executable Contract Value*, limited to maximum 3% of Executable Contract Value, will be withheld.

v) Amount already withheld, if any against slippage of M1 milestone, shall be released only if there is no delay attributable to contractor in achievement of M2 Milestone.

vi) Amount required to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld out of respective milestone payment and balance amount (if any) shall be withheld @10% of RA Bill amount from subsequent RA bills.

vii) Final deduction towards LD (if applicable as per clause 2.7.9 above), on account of delay attributable to contractor shall be based on final delay analysis on completion / closure of contract. Withheld amount, if any due to slippage of identified intermediate milestone(s) shall be adjusted against LD or released as the case may be.

viii) In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.

* Executable Contract Value - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.

8. **Conflict of Interest among Bidders/ Agents:**

"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. ***The bidder found to have a conflict of interest shall be disqualified***. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

a) they have controlling partner (s) in common; **or**

b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; **or**

c) they have the same legal representative/agent for purposes of this bid; **or**

d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**

e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; **or**

f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following:

1. The principal manufacturer directly or through one Indian agent on his behalf; **and**

2. Indian/foreign agent on behalf of only one principal;

or

g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**

h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business."

9. **Acceptance of Bank Guarantee (BG)**

Revision in Acceptance of Bank Guarantee (BG) Clause no. 1.10.3 (iii) of Vol I C GCC:

Clause No. 1.10.3 (iii) of Vol IC GCC is revised as below: -

"Bank Guarantee issued by:

a. Any of the BHEL consortium bank listed below:

State Bank of India
ABN Amro Bank N.V.
Bank of Baroda
Canara Bank
Citi Bank N.A.
Corporation Bank
Deutsche Bank
HDFC Bank Ltd.
The Hongkond and Shanghai Banking Corporation Ltd
ICICI Bank Ltd.
IDBI Ltd.
Punjab National Bank
Standard Chartered Bank
State Bank of Travancore
State Bank of Hyderabad
Syndicate Bank

b. Any public sector Bank (other than consortium banks) with a clause in the text of Bank Guarantee that "**It is enforceable at Nagpur, Maharashtra**".

c. Any private sector banks, with a clause in the text of Bank Guarantee that "**It is enforceable by being presented at any branch of the bank**".

Note: "Bank Guarantees issued by Co-operative Banks are not acceptable".

10. **Broad Terms & Conditions of Reverse Auction:**

In continuation to Clause 19.0 of NIT (Notice Inviting Tender) following are the broad terms and conditions of Reverse Auction:

*"BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) (**https://www.bhel.com/guidelines-reverse-auction-2024**) for this tender. RA shall be conducted among the techno-commercially qualified bidders.*

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

Note:-

1. Reverse Auction will be conducted if two or more bidders are techno-commercially qualified .
2. Wherever RA is opted in a tender, the techno-commercially qualified H1 will not be allowed to participate in RA. In case more than one H1 bidder quote the same rate, the Price Offer received last, as per the time log of the Portal, shall be removed first, on the principle of last in, first out by the system.
3. However, H1 will be allowed to participate in RA in the following cases:

   a) If number of techno-commercially qualified bidders are only 2 or 3.

   b) In case Primary product of only one OEM is left in contention for participation in RA on elimination of H1.

   c) For cases where there are more than 3 techno-commercially qualified bidders, if lowest bidder in sealed price bid is non-MSE and H-1 is eligible MSE and H-1 price is coming within price band of 15% of Non-MSE lowest bidder.

   d) For cases where there are more than 3 techno-commercially qualified bidders, if lowest bidder in sealed price bid is non-MII and H-1 is eligible MII and H-1 price is coming within price band of 20% of Non-MII lowest bidder.

11. **PRICE VARIATION COMPENSATION (Clause No. 2.17 of Vol C GCC):** Applicable. However Clause no. 2.17.6 is being revised as below

Existing	Revised As
Base date shall be calendar month of the 'last date of submission of Tender'	Base date shall be calendar month of the 'date of start of work at Site'

12. **Commencement Period for "Performance Guarantee for Workmanship**" as per clause no 2.24 of Vol-IC GCC: This period shall commence after the completion of Contract as certified by Engineer-in-Charge

Bidders kindly to take note that EMD (Earnest Money Deposit) shall be furnished by MSE bidders as well, as per the amount and procedure indicated in the NIT/GCC.

3096

TECHNICAL CONDITIONS OF CONTRACT (TCC)

S. No.	DESCRIPTION	Chapter
Volume—I	Part—I: Contract specific details	
1	Project Information	Chapter—I
2	Scope of Works	Chapter—II
3	Facilities in the scope of Contractor/ BHEL (Scope Matrix)	Chapter—III
4	T&Ps and MMEs to be deployed by Contractor	Chapter—IV
5	T&Ps to be deployed by BHEL free of hire charges on sharing basis	Chapter—V
6	Time Schedule	Chapter—VI
7	Terms of Payment	Chapter—VII
8	Taxes and other Duties	Chapter—VIII
9	Specific Inclusion	Chapter—IX
10	Specific Exclusions	Chapter-X
11	BILL OF QUANTITY & Weightages/ Factor	Chapter-XI

1.0	Project Information
1.1	1. Purchaser / Owner :**M/s NTPC** 2. Project Title : NTPC Korba FGD Stage –I (3X200 MW) and Stage-III (1X500MW) LOCATION AND APPROACH: Location: The site is located on the western bank of river Hasdeo near Korba town in Korba District of Chhattisgarh State. The site is contiguous to the Right Bank Irrigation Canal emanating from Hasdeo Barrage. BALCO's aluminium plant and two power stations are already located on both the banks of Hasdeo river in the vicinity. Korba town is a broad gauge railhead 37 kms away from Champa railway station on Calcutta-Nagpur main line of South-Eastern Central Railway and is approximately 510 kms from Nagpur by rail. The site is very close to all weather road between Katghora & Korba and is approximately 110 kms from Bilaspur and 10 kms from Korba town NOTE: The Bidder shall visit site and get acquainted himself with the conditions prevailing at site before submission of the bid. The information's given here in under are for general guidance and shall not be contractually binding on BHEL/ Owner. The information's given here are based on basic engineering. This information's may change during detailed engineering. All relevant site data/ information's as may be necessary shall have to be obtained /collected by the Bidder.

2.0 SCOPE OF WORK

The scope of work under the specification broadly covers the receipt of materials from BHEL/customer stores/storage yard, handling at stores/storage yard, transportation to site of work, preassembly, erection, testing, pre-commissioning tests and checks and handing over of complete electrical and C&I work for the Flue Gas Desulphurization(FGD) system and its auxiliaries for the project.

The work under this scope being quite sophisticated and also quite extensive, for proper planning, monitoring, reporting, etc. of ongoing works, the contractor shall establish his own computer(s) and printer(s) at his site office, along with suitable operator(s), consumables, etc.

BHEL is operating web based computerized SSD/IPMS/SCMS/E-store etc system that includes, inter-alia, issue of materials, daily progress reporting, Contractor's running monthly billing and material reconciliation through a computerized data management system. Contractor shall install necessary hardware to hook-up with the BHEL's system and use the same for his scope of work. The contractor shall also provide adequate and suitable manpower for co-ordinating, data gathering in suitable format, computer operations for implementation of SDD/ IPMS/ SOMS at site.

Contractor may tie up with separate suitable agency/agencies for carrying out Bus Duct, Relay Testing and Integrated Testing. However before deploying such agencies on job, the Contractor shall obtain approval of BHEL Construction Manager in writing.

Supply & erection of consumable like conduit accessories & fittings, conduit boxes, saddles, clamps, flexible conduit, fixing hardwares, anchors, wedges, nuts & bolts, concrete inserts etc materials required for mounting the fixtures, consumable and other incidental materials required to complete the installation, testing & commissioning of complete lighting system for successful operation, & to the satisfaction of purchaser/ customer. Supply scope of these items shall form part of the installation rates quoted for the item.

Dry type Transformers, Commissioning of HT/LT Drives Electrical Hoists and valve/ damper actuator, Bus duct, cabling package, C&I Package and associated Instruments/Transmitters, equipment & Associated Auxiliaries for the following: -

1. HT/LT power cables (generally arm/unarmoured), LT control cables, instrument cable (generally arm/unarmoured, screened or unscreened).
2. Junction boxes for electrical, Control & Instrument system and push button.
3. Switchgears / MCC/Bus duct
4. Starter panel/Local starter boxes/Power distribution boxes /marshalling boxes. DCS panels, control & instrument panel, LIE, LIR etc.
5. Erection and commissioning of Earthing & Lightning Protection system.
6. Erection and commissioning of Station lighting system
7. Erection and commissioning of Control panels.
8. FGD system trial run, resolving any deficiencies observed and handing over the FGD system to customer M/s NTPC.
9. Others equipment.

2.1 GENERAL REQUIREMENTS

2.1.1 The intent of specification is to procure services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

2.1.2 The work to be carried out under the scope of this specification covers the complete work of loading, handling, transporting, unloading, preassembly, erection, calibration, testing, air flushing, pre commissioning tests, commissioning of systems, trial run of various auxiliaries and equipment, achieving various milestones till handing over of the unit to BHEL's customer. The work shall conform to dimensions and tolerances specified in various drawings that will be provided during the erection. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by engaging other agencies or departmentally and recoveries will be effected from contractor's bills towards expenditure incurred including approx. 30% departmental charges.

2.1.3 The terminal points decided by BHEL shall be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.

2.1.4 The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of BHEL, BHEL's customer, customer's consultants and other contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work of the project as a whole.

2.1.5 The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The contractor should ensure proper planning and successful & timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

2.1.6 Contractor shall erect, align and commission all the equipment and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical and project requirements. Availability of materials and fronts will decide this. BHEL engineer's decision regarding correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods / sequences adopted in erection of similar sets elsewhere.

2.1.7 All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory authorities are to be arranged by the contractor expeditiously at his cost in time to ensure smooth progress of work.

2.1.8 The work shall conform to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to contractor's fault, the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by BHEL and recoveries will be effected from the contractor's bills towards expenditure incurred including cost of materials and approx. 30% departmental overheads of BHEL.

2.1.9 BHEL reserves right to recover from the contractor any loss, which arises out of undue delay/ discrepancy/ shortage/ damage or any other causes due to contractor's lapse during any stage of work. Any loss to BHEL due to contractor's lapse shall have to be made good by the contractor.

2.1.10 All transport equipment, handling equipment, tools, tackles, fixtures, equipment, materials, manpower, supervisors/ engineers, consumables etc., except otherwise specified as BHEL scope of free issue, required for this scope of work shall be provided by the contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clauses. The contractor's quoted rates should be inclusive of all such contingencies.

2.1.11 During the course of erection, testing and commissioning certain rework / modification / rectification / repair / fabrication etc., may become necessary on account of feedback / revision of drawing. This will also include modifications / re-works suggested by BHEL / customer / other inspection group. Contractor shall carry out such rework / modification /

rectification / fabrication / repair etc., promptly and expeditiously. Daily log sheets signed by BHEL engineer and indicating the details of work carried out, man-hours etc. shall be maintained by the contractor for such reworks.

2.1.12 All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipments / components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting up etc., as may be applicable in such erection works and which are treated incidental to the erection works and necessary to complete the work satisfactorily, shall be carried out by the contractor as part of the work within the quoted rates.

2.1.13 The contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work (excepting those specifically included in BHEL scope). However, necessary steel will be provided from the scrap / surplus materials available at site.

2.1.14 The contractor shall take delivery of the components, equipment, chemicals, lubricants etc from the BHEL stores/ storage area after getting the approval of BHEL engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipments after usage shall be submitted to the BHEL and reconciled periodically.

2.1.15 Contractor shall plan and transport equipments, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, contractor shall do it most expeditiously. No claim for extra payment for such work will be entertained.

2.1.16 The contractor shall take delivery of equipment, materials from the storage yard/ stores/ sheds of BHEL/ customer. He shall also make arrangements for verification of equipment, transportation up to site of work, safe custody, watch and ward of equipment after it has been handed over to him till these are fully erected, tested and commissioned and taken over by the customer. The contractor should note that the transport of equipments to erection site, assembly yards etc. should be done by the prescribed route without disturbing the other works and contractors and in the most professional manner. Site store may be approx. 2-3 km from the site. Special equipments such as measuring and control equipments, panels, electronic items, switches, cables, conduits etc. shall be stored when taken over by the contractor in appropriate manner as per BHEL's instructions.

2.1.17 Plant materials should not be used for any temporary supports / scaffolding / preparing pre-assembly bed etc.

2.1.18 The services, tests and support to be provided by the agency for the work mentioned in various sections of this tender are indicative and not exhaustive, and not limited to these for completion of the work in all respects.

2.1.19 The weight & dimension as mentioned against the individual items in Price Bid / Rate Schedules or elsewhere in the tender specification are indicative approximate and there may be variation in dimension & weight in actual supply of equipment. No rate variation shall be considered on this account.

2.1.20 The scope of work & description of system / equipment as given in the various clauses of this tender specification and rate schedule are only for understanding the system requirement, contractor shall note this point and assess the volume of work prior to submit the offer.

2.1.21 The contractor shall have total responsibility for all equipment and materials in his custody at contractor's stores, loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as

per BHEL engineer's instructions. The machined surfaces/finished surfaces should be greased and covered.

2.1.22 At all stages of work, equipment/materials in the custody of contractor, including those erected, will have to be preserved as per the instructions of BHEL.

2.1.23 The contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/ equipment in their custody and installed equipment from theft/ fire/ pilferage and any other damages and losses.

2.1.24 The contractor shall collect all scrap materials periodically from various levels of powerhouse, working area of the power station, auxiliary and piping around power station and collect the same at one place earmarked for the same. Loads of scraps are to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such, BHEL reserves the right to collect and remove the scrap at contractor's risk and cost, if there is any failure on the part of contractor in this respect. 1% value of each RA bill will be earmarked against compliance of the above, to be released only on satisfactory collection and deposit of scrap as stated above. In case of failure of contractor to comply with this requirement, BHEL will make suitable arrangement at contractor's risk and cost. In such case, any expenditure over and above the withheld 1% amount will also be recovered suitably from the RA bills of vendor.

2.1.25 The entire surplus, damaged, unused materials, packaging materials / containers, special transporting frames, gunny bags, etc., shall be returned to BHEL stores by the contractor.

2.1.26 The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/ excess utilization of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.

2.1.27 For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

2.1.28 Housekeeping in the erection and preassembly area is as important as the well-planned and orderly work. The access to site for inspection approaches by BHEL and customer engineers and leading of the material shall be made available by the contractor at all times. The shifting and re-shifting of erection materials, tools and plants and clearance of restrictions, filling of ditches, undulation near preassembly and switch yard area is the responsibility of the contractor. Contractor should visit the site and acquaint himself with all restrictions and difficulties that he may encounter during erection/commissioning stages.

2.1.29 The contractor shall handover all parts/materials remaining extra over the normal requirement with proper identification tags in a packed condition to BHEL stores. In case of any misuse or use over actual design requirements, BHEL reserves the right to recover the cost of parts/materials used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor.

2.1.30 The contractor should take all reasonable care to protect equipment and materials under his custody either in his stores or at site. Copper tubing, brass fittings, brass valves etc. Forming an integral part of equipment or system are liable to greater damages/ pilferages / theft / losses. It will be responsibility of contractor to arrange for adequate security round the clock for protection from such damages/ pilferages/ theft/ losses.

2.1.31 The contractor shall ensure that all the packing materials and protection devices used for the various equipment during transit and storage are removed before the equipment are erected in position.

2.1.32 Overhauling, cleaning, revisioning, servicing of equipment during erection and commissioning stages will be arranged by the contractor. All equipment shall be preserved and protected before and after erection as per the advice of BHEL engineer.

2.1.33 Contractor shall prepare Marked-Up drawings incorporating modifications and deviations from original drawings or prepare fresh sketch for actual installation / connection details if need be, that can be converted to "As-built" drawing.

2.1.34 **Contractor shall abide by the safety/ security rules and regulations as per the requirement of BHEL and BHEL's customer. Contractor shall obtain information about all safety and security norms of BHEL and BHEL's customer well in advance. BHEL will not admit any claims whatsoever on account off Contractor's non-familiarization of site safety and security regulations.**

2.1.35 Some systems/items are common in Stage-I , Stage-II and Stage-III . Hence, contractor to help other working agency also to complete the system .

2.2 BRIEF DESCRIPTION OF THE FGD SYSTEM

2.2.1 The FGD system shall be based on Wet Limestone Forced Oxidation process. Each unit shall be provided with an independent absorber.

2.2.2 Gas from terminal point on ID fan discharge duct shall be taken directly to the absorber through Booster Fans. In the absorber, SO2 in flue gas shall be removed by a spray of recirculating slurry, pumped by slurry recirculation pumps.

2.2.3 Compressed oxidation air shall be blown through the slurry in the oxidation tank, to oxidize the Calcium sulphite to gypsum.

2.2.4 Clean gas from the absorber shall be taken to the Wet Chimney through three stage mist eliminators.

2.2.5 Limestone to the absorbers of the units shall be supplied by a wet limestone grinding system, common for the units. Limestone shall be fed to the Limestone day silos which in turn will feed the Limestone to wet ball mill through a gravimetric feeder.

2.2.6 The gypsum from the absorber(s) shall be pumped by dedicated gypsum bleed pumps to a common Gypsum Dewatering system consisting of two streams (2x100%) of primary and secondary hydrocyclone and vaccum belt filters for gypsum dewatering. The water removed from the absorber shall be recycled to the absorbers. The waste water from the system shall be collected and neutralized using lime and neutralized effluent shall be pumped at required pressure to waste water terminal point.

2.3 TESTING, PRE-COMMISSIONING, AND POST COMMISSIONING

2.3.1 The contractor shall perform various activities during pre-commissioning, integrated testing, post-commissioning stages of equipment covered under this tender specification. It is responsibility of contractor to arranged tools & plants, test equipment, experienced engineers and technicians. Contractor shall earmark separate manpower for respective commissioning areas and they shall not be disturbed /diverted for other work. The contractor's commissioning group shall work as per the instruction of BHEL Engineer and they shall coordinate day-to-day activity with other agency and BHEL/ Customer. The testing activity may have to be repeated till satisfactory results are obtained and also to satisfy the requirement of Customer / statutory Authority.

2.3.2 The contractor shall simultaneously start testing & commissioning activities for equipment's to match the mile stone activities of the project.

2.3.3 The mobilization of these commissioning groups shall be such that planned activities are taken up in time and also completed as per schedule and work undertaken round the clock if required. It is responsibility of contractor to discuss on day to day / weekly / monthly basis the requirement of manpower, consumables, tools & tackles / testing equipment with BHEL Engineers and arrange for the same. If at any time the requisite manpower, consumables, testing equipment etc are not arranged then BHEL shall make alternative arrangements and necessary recoveries with overhead cost will be made from the running bills.

2.3.4 Contractor shall cut/ open work, if needed, as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over.

2.3.5 It shall be specifically noted that the contractor may have to work round the clock and in shifts during the pre-commissioning and commissioning period along with or without BHEL engineers and hence considerable overtime payment is involved. The contractor's quoted rates shall be inclusive of all these factors.

2.3.6 In case any rework/ repair / rectification/ modification / fabrication etc is required because of contractor's faulty workmanship which are noticed during the commissioning of, at any stages, the same shall be rectified by the contractor at his cost. If during the commissioning any improvement / repair / rework / rectification / fabrication / modification due to design improvement is required, the same shall be carried out by the contractor promptly and expeditiously.

2.3.7 During the commissioning activities and carrying out various tests, if any of temporarily work such mounting of test equipment / cabling etc are required, the contractor shall carry out such work without any extra cost. The same shall be removed after completion of the activity.

2.3.8 During this period, though BHEL/ client's staff will also be associated in the work, the contractor's responsibility will be to arrange for complete requirement of men and required Tools & Plants, Consumables, Scaffolding and approaches etc., till such time the commissioned unit is taken over for trial operations.

2.3.9 The contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.

2.3.10 The pre-commissioning activities will start in a phased manner to meet the various milestones and shall continue till equipments are commissioned fully with all connected equipment / devices or handed over to customer for regular operation. In this duration other erection activities such as cabling etc., shall be carried out by other agencies even though equipments are partially commissioned / charged. In order to co-ordinate the work such as issue of safety permit, normalization and compliance of other requirement, contractor shall keep team of experienced engineer, supervisor, technician and helper in each shift as decided by BHEL Engineer. The team shall take instruction from BHEL Engineer for day-to-day work and shall not be diverted for other work. No extra payment shall be made for their services.

2.3.11 **This contract includes all the areas for Stage-II and common areas which are not specifically mentioned in this TCC. Vendor is requested to visit site before quoting thee price.**

2.4 WELDING, NON-DESTRUCTIVE TESTING ETC.

2.4.1 Installation of equipment involves good quality welding, NDE checks etc.

2.4.2 Welder deployed for aluminium welding shall have experienced and approved by BHEL and BHEL's Customer after due qualification process/testing.

2.4.3 Welding of all structural steel & aluminium shall be done only by the qualified and approved welders.

2.4.4 All the welders shall be tested and approved by BHEL engineer/ Customer's quality engineer before they are actually engaged on work though they may possess IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason.

2.4.5 The welded surface shall be cleaned of slag and painted with primer paint to prevent corrosion. For this paint will be supplied by the contractor.

2.4.6 Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications.

2.4.7 Certain types of coated welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the coated welding electrodes have to be carried in portable ovens.

2.5 MEASUREMENTS & WASTAGE & CUTTING ALLOWANCES:

2.5.1 For all payment purposes, measurement shall be made on the basis of the actual execution of work in line with drawings/documents/ site requirements. Physical measurements shall be made by the contractor in the presence of BHEL Engineer.

2.5.2 The measurement for cable, impulse pipes/tubes, GI pipe, conduits, flexible conduits, trays etc., shall be made on the basis of length actually laid.

2.5.3 All the surplus, scrap and serviceable materials, out of the quantity issued to the contractor shall be returned to BHEL in good condition and as directed by the engineer.

2.5.4 All materials returned to stores should carry aluminium tag indicating the size and type. Cables more than 15 meters length is termed as serviceable material and shall be returned size wise and category wise to the owner's stores/yard. Cable of serviceable length being returned to the stores in drums shall have their free ends sealed and the balance lengths on the drum(s) shall be noted and certified by the Engineer-in-charge. This shall be applicable only for the purpose of accounting the cables issued for installation.

2.5.5 While carrying out material reconciliation with contractor, all the above points will be taken into account. All serviceable material returned by the contractor shall be deducted from the quantities issued for the respective sizes and categories and the balance quantity (ies) will be taken as the net quantity (ies) issued to the contractor. Material reconciliation shall be done and allowable scrap quantity calculated as per wastage allowance percentage specified above. Any scrap/wastage generated by the contractor in excess of the allowable percentage shall be charged at the rates decided by the Engineer whose decision shall be final and binding on the contractor.

2.5.6 For all site-fabricated steel items such as supports, racks, frame, Canopy etc. physical measurement shall be made and then converted to tonnage. For steel material supplied to the contractor, all scrap shall be returned to BHEL stores with due accounting.

2.5.7 Every month the contractor shall submit an account for all the materials issued to him by BHEL in the standard Performa prescribed for this purpose by the site in charge.

2.5.8 The erection contractor shall make every effort to minimize wastage during erection work. Cutting and wastage allowance shall be computed on length, weight of material actually used, measured and accepted. In any case, the wastage shall not exceed the following limits;

S. No.	Item	% Wastage on issued Qty
01.	Each iron/steel section	2
02.	Each size of power cables	1
03.	Each size of control / shielded cable	2

2.5.9 If the actual wastage is more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

2.5.10 The cable take off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. For this purpose, the exact route length between various equipment/ panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length and the type of cable required for various destinations, the cable drums shall be suitably selected for cable laying. Any jointing shall have to be approved by BHEL engineer. All the cut pieces/bits of cables, which are not used, shall be returned to the purchaser for accounting towards wastage. The cables damaged by the contractor shall have to be replaced by the contractor at his own cost.

2.5.11 NOTE:

Salvageable scrap shall mean lengths of pipes/tube/conduits, multi core cables, other cables etc., that can be used one time or other at a later date and normally they are recovered from the cut-pieces of pipes, multi core cables, cables etc.

Non - Salvageable scrap means the lengths of tubes, pipes, multi core cables, cables etc., and they are from cut-pieces of tubes, pipes, multi core cables, cables etc., that cannot be used at all one time or other.

2.5.12 The rate of laying for LT power, control and signal cable is inclusive of glanding and termination at both ends. Glands & Lugs above 4sq mm shall be supplied by BHEL Lugs up to 4 sqmm shall be in vendor‘s scope. The LT Power Cable straight through Jointing Kit (if required) shall be in Vendor’s scope of supply. The rate for erection will be part of laying rates. No separate rate is applicable on this account.

2.5.13 The unit rates for the HT cable termination (if applicable) are exclusive of unit rates for laying of HT cables. Glands & termination kits for HT cables (3.3kV and above) shall be supplied by BHEL.

2.6 FINAL PAINTING

2.6.1 The contractor shall provide all the primer, paint, and other consumables like brush, cleaning agents etc. All T&P, manpower, supervision is in contractor's scope. Painting shall be carried out as per colour scheme approved by BHEL/ BHEL customer (NTPC).

2.6.2 All metal parts of the equipment including supports, structures, etc., as applicable shall be painted after thoroughly cleaning the surface from dust, rust, greases, oils, scales, etc, by wire brush, scrapping, shot Blasting (as applicable) etc; as specified in relevant erection documents. The above parts shall then be painted with specified two coats of specified paint over the shop primer/paint. Also, where the shop primer/paint has peeled off, the affected area shall be cleaned thoroughly by the specified method and then primer coat applied. Similarly, certain components may be supplied without any primer/paint coat from shop. The surface of such items shall be cleaned as per specifications, coated with suitable primer and then coated with final paint coats. The dry film thickness after final coat should be as per specification. The color, shade etc. shall be as per specification. Painting schedule will be furnished at site. The scope of painting work is for the following areas. Primer and paint shall be sourced only from the manufacturers, approved by BHEL. In order to have consistency in painting system, it is preferable that all the supplies are sourced from one single manufacturer.

2.6.3 All the fabricated frames, racks, supports, panel base frame etc. wherever applicable shall be painted with two coats of primer or as per painting schedule and followed by two coats of paint as specified earlier herein. In case of G I Structure, the cold galvanizing paint to be applied as touch up where ever needed. This is to be done as per instruction of BHEL engineer. The Paint required for this purpose is in scope of Contractor

2.6.4 Touch-up painting of LT MCC/ Control Panels or any other equipment /devices wherever necessary.

2.6.5 The primer shall be compatible with the final coat paint schedule.

2.6.6 Full (Spray) painting of transformers, bus ducts with two coats of paint as per specification

2.6.7 Supply of paint, primers, other consumables etc for above and any other scope in these specifications shall be in Contractor's scope.

2.6.8 Irrespective to scopes of painting & supply of paint mentioned elsewhere it is to be noted that supply of paint, primers, other consumables etc for all primer/ painting works is to be done by the contractor. No dispute shall be entertained on this matter.

2.6.9 Colour Banding, Legend and Identification Marking, Direction marking etc. shall be in scope of the contractor.

2.7 TROUBLESHOOTING DURING PLANT OPERATION

During pre-commissioning / commissioning stages when the plant will be under various stages of operation, it will be necessary to have continuous (day and night) presence of suitable manpower along with required tools to attend to any defects etc that may arise during such operation. The contractor will be required to put such personnel in shifts in electrical area. The bidder must also take this aspect into consideration.

2.8 Equipment / instruments etc., under the above scope of erection and commissioning are generally dispatched from BHEL's manufacturing units / vendor's works at site well before start of erection. Sometimes, such dispatched materials may get stuck up with transporters/railways. The contractor shall provide support / manpower for necessary chase up for removal of such bottlenecks in transportation. Also, for smaller items, it could be necessary to depute his person to personally carry certain items from works to site. Requirement of such activities, which will be decided by BHEL engineer and chase up activities, if required, shall be performed under authorization by BHEL. The above services shall be provided within the quoted rates.

2.9 STATUTORY CLEARANCES

2.9.1 The contractor will have following valid certificates:

2.9.2 The contractor will have the applicable valid Contractor Electrical License for Applicable Voltage System to work in Chhattisgarh State. All the fees and expenses in this regard shall be to the contractor's account.

2.9.3 Supervisory Competency Certificate of Applicable Voltage equipment for their erection, testing & commissioning for work in Chhattisgarh State. During the execution of work minimum two persons should be posted at site who have valid Supervisory Competency Certificate.

2.9.4 If the contractor does not have these licenses and statutory requirements, then the contractor has to arrange them to work in the concerned state where the project is being executed within 6 weeks of mobilization at site for carrying out the works covered under this contract.

2.9.5 Obtaining Statutory Approvals for Electrical Inspector or any other Governing Agency is included in the contractor scope.

2.9.6 Contractor should have obtained valid Electrical Contractor-ship License to carry out the Erection, Testing & Commissioning work on High/ Low Voltage electrical equipment from the appropriate statutory authority of concern state or Central Electricity Authority, as the case may be. All fees and expenses in this regard shall be in the contractor's account.

2.9.7 Contractor shall arrange inspection of concerned Statutory Authority for the installation, testing & commissioning of High/ Low voltage equipment covered under this tender specification and obtain their approval in appropriate format prior to charging of the equipment.

2.9.8 Contractor shall be responsible for all necessary liasioning work with Statutory Authority towards the certification of installation/ works. BHEL shall reimburse Statutory Fees as per actual on submission of original receipt, however all incidental expenses shall be borne by Contractor. BHEL/ BHEL's Customer shall be providing technical assistance, drawing & document for submission to Statutory Authority. Contractor shall provide all logistics services in this regard.

2.9.9 The installation of all electrical equipment shall be carried out only by persons holding valid certificates of Competency for the voltage classes as defined in this tender specification, issued by applicable appropriate State or Central Statutory Authority. Contractor shall submit the particulars of Licenses held by him.

2.9.10 All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory authorities are to be arranged by the contractor expeditiously at his cost in time to ensure smooth progress of work.

2.9.11 If more than 20 nos. labor are employed by contractor for subject work, then labour license has to be obtained.

2.9.12 Compliances of All statutory formalities related to labor law, local laws, etc. is must. Registration of EPF, ESIC, PMJJBY, PMSBY is must for all labors shall be employed for subject tender.

2.9.13 RABs must be submitted with all supporting documents like – Signed protocol / log sheet, Wage certificate, EPF, ESIC, ECS, PMJJBY, PMSBY, etc. and other documents as per instruction of BHEL site engineer.

2.10 GATE PASS FORMALITIES

2.10.1 The contractor shall make his own arrangements of gate pass for his vehicles, T&Ps etc. as prescribed and instructed by the NTPC /CISF at his own cost, each gate pass has to be endorsed by the NTPC / CISF before the pass can be used. In case of termination of the service of any of T&Ps or any vehicle during the contractual period, the contractor shall have to surrender the gate pass to the NTPC /CISF at the end of the project all the gate passes endorsed by the NTPC / CISF for use of the contractor's vehicle, T&Ps shall have to be returned.

2.10.2 Vehicles equipped with flame arrester will only be allowed inside the premises. Valid RC book, insurance, fitness certificate, road tax certificate, PUC, driving license, etc. is required for gate pass formalities of all vehicles. Goods carrying certificate is also required for goods category vehicles. Gate pass formalities may take some time, so contractor has to plan well in advance accordingly.

2.10.3 The contractor shall make his own arrangements of gate pass for his employees / workers as prescribed and instructed by the NTPC /CISF at his own cost, each gate pass has to be

endorsed by the NTPC/ CISF before the pass can be used. In case of termination of the service of any of his employee during the contractual period, the contractor shall have to surrender the gate pass issued to the employees to the NTPC / CISF. At the end of the project all the gate passes endorsed by the NTPC / CISF for use of the contractor's employees shall have to be returned.

2.10.4 Police verification and medical fitness certificate of all workers / employees of agencies is must for gate pass formalities. Contractor has to arrange the same at his own cost. Gate pass formalities may take time, so contractor has to plan well in advance accordingly.

2.10.5 PPEs and Dangri is must for all workers and staffs working inside NTPC premises. Contractor has to arrange all these for their worker and staffs at their own cost.

2.10.6 Deployed electricians should have valid qualification & valid electrical license for gate pass .

The contractor's scope of work is further described in the clauses hereafter:

The work will comprise of, but not limited to the following:

GENERAL:

Accepted unit rates for each SWGR/ panel shall remain firm regardless of any change in width, height, type, weight or other parameter (except length), as furnished in tender. For variation in length, adjustment to accepted rate of SWGR/ panel shall be based on following modality. Decision of BHEL shall be final & binding on bidder.

For variation in length within +/- 15% of SWGR/ panel, accepted unit rates shall remain firm.

For variation in length of SWGR/ panel beyond +/- 15% of specified length, wherever indicated in the tender, rate of unit length of variation shall be arrived by dividing the item rate by length as indicated in tender and rate/ price adjustment for payment during execution for length excess/ shortage over & above the +/- 15 % variation of indicated length shall be done accordingly on the following basis.

Based on above, if actual length exceeds variation limit, accepted unit rates will undergo change for the portion beyond 1.15/ 0.85 times of indicated length, additional payment/ recovery will be effected by BHEL in the following manner.

Length of SWGR/ panel as indicated in tender = A.

Accepted unit rate for SWGR/ panel = Rs B.

Rate per unit length (L) to be considered for the purpose of additional payment/ recovery for variation in length = Rs B/A = Rs C.

Actual length of the SWGR/ panel = D.

Additional payment/ recovery in unit rate for variation of length beyond length (1.15A/ 0.85A) = (D-1.15A)/ (0.85A-D) x C.

Applicability of new size of cable tray, cable, etc for a project of such magnitude may be inevitable. To derive rates of such new items of installation of cable tray, laying of cable, cable termination, etc, which are not covererd in BOQ of Volume-III, following guidelines shall be applicable for this tender. Decision of BHEL shall be final & binding on bidder.

For new size cable tray, width of cable tray will be taken into reference and rate of installation of cable tray of nearest width will be pro-rated to derive the rate for installation of new cable tray.

To derive the rate for laying of new size cable, OD of cable will be taken into reference and rate of laying of cable of nearest lower OD will be pro-rated to derive the rate for laying of for new cable.

Rate for termination of new size cable and other items will be derived based on mutually agreed modality and on approval of BHEL.

~~2.11 CABLE TRAYS/ CABLE DUCTS WITH SUPPORTS AND ACCESSORIES~~

~~2.11.1 Various types of sheet metal, galvanized cable tray, i.e. Perforated, ladder type, sheet metal duct, solid bottom tray, pre fabricated structural trays etc. shall be provided in standard lengths along with accessories like hardware, bends, reducers, coupler plate, tray covers and tray clamps etc. Tightening/ fastening of tray clamp shall be under contractor's scope.~~

~~2.11.2 Installation of cable tray/ cable duct shall include cutting, laying, jointing, supporting, drilling holes in the support, fixing tees/ reducers/ bends/ clamps as per tray route layout, fabrication of bends/ tees/ reducers from straight length, fixing of tray covers, welding of tray on support, cleaning and application of cold galvanizing paint on weld joints. Installation of tray/ duct~~

~~covers, wherever provided, will be done as a part of tray erection and no extra rates will be payable.~~

~~2.11.3 Fabrication of bends/ tee/ reducers from straight length of tray is within the scope of work and rate quoted shall be inclusive in unit rate (in running meters). All site welds of cable trays shall be painted with approved primer and cold galvanizing paint, which shall be arranged by the contractor.~~

~~2.11.4 Before start of work support structure/ cable tray work in cable vault, the existing cables of fire alarm system, power and control cables are to be protected to avoid the damage from fire, cutting welds and etc.~~

~~2.11.5 "Structural steels for support" materials are supplied to make supports for cable trays (in the buried RCC trenches, overhead tray arrangement on pipe racks and cable tray arrangement in cellars & other arrangements as applicable for the project. These are also required for making of frames for PB stations, junction boxes as per the project requirements. Drilling of holes in ISA for bolting of cable trays shall be done by Erection Agency. The holes in the cable trays shall be provided by the cable tray vendor, however in case of requirement of additional holes to be drilled for Cable Trays for the purpose of Cable Tray erection, same shall be done by the Erection Agency. Erection Agency shall ensure that all steel structure used for Electrical installation shall be painted with one coat of Red Oxide Zinc Chromate Primer of approved shade for indoor installations. Supply of Red Oxide Zinc Chromate Primer for site painting of all structural steels (required for cable tray supports) shall be in the Erection Agency's scope. Erection Agency shall ensure that after welding and drilling (if any) of the steels bracket, above mentioned paint of approved shade shall be applied. The structural steel work shall be carried out in line with the customer's/ consultant's technical specifications.~~

~~2.11.6 In case cable trays are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instance. The work will commence~~

~~2.11.7 Cable trays/ ducts etc. may have to be routed underground in cable trench, over head on structure, along the walls, floors etc. for various applications such as cable laying, conduits, thermocouple, temperature gauge etc.~~

~~2.11.8 Cutting and rerouting shall be carried out within the quoted rates for completion of work.~~

~~2.11.9 The cable trays shall be supported in general at a span of 1.5m horizontally and at a distance of 1m vertically.~~

~~2.11.10 All sharp edges and burr shall be removed.~~

~~2.11.11 Cable tray on the top tier shall have cover whenever running below pipes.~~

2.11.12 ~~Cable trays shall be numbered as per layout drawing before laying of cables~~.

2.12 CABLE LAYING (POWER/ CONTROL/ INSTRUMENTATION: SHIELDED/ UNSHIELDED/ PLUG-IN/ COAXIAL/ UTP/ STP/ DATA HIGHWAY, ARMOURED/ UN-ARMOURED, SINGLE/ MULTI-CORE, PVC/ HR PVC/ FRLS/ TEFLON/ PTFE/ XLPE INSULATION, OPTICAL FIBER, ETC.)

2.12.1 Cable laying includes cutting to the required length, laying in overhead cable racks/ underground cable trench/ pipes/ flexible conduits, dressing/ clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing PVC numerical/ alphabetical/ printed ferrules, termination by using crimp type copper tinned/ aluminium lugs, insulated/ un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, providing identification PVC/ aluminium cable tags continuity checking, insulation resistance checking, high voltage test on HT cables. Contractor to arrange adequate numbers of his own ferrule printing machines.

2.12.2 All cables shall be provided with minimum of 2mm thick aluminium sheets as cable identification tags indicating cable designation in accordance with the cable schedule. The cable tags shall be provided at the ends as per cable schedule, when the cable changes direction/ elevation. The cable tags shall be of aluminium with the number punched on it and securely attached to the cable by not less than two turns of 20 SWG GI wire conforming to IS:280. Alternatively, cable may also provide cable tags made of nylon, cable marking ties with cable number heat stamped on the cable tags.

2.12.3 For buried cable, the marker shall project at least 150mm above ground and shall be spaced at an internal of 20m and at every change of direction.

2.12.4 All the cables shall be clamped to the cable trays/ support structure with the help of clamps. Cables to be strapped to tray at interval not greater than 300mm. All power cables shall be clamped individually and control cables shall be clamped in groups of 3 or 4 cables. Clamps for multicore cables shall be fabricated out of 25x3mm aluminium flats. Single core power cables shall be laid in trefoil formation and suitably clamped with Al cast/ Glass Fiber Clamp. All sharp edges and burr shall be removed. Erection Agency shall carry out the plant cabling works in line with customer/ consultant's Technical Specification.

2.12.5 Cables to be strapped to tray at interval not greater than 300mm.

2.12.6 Laying of Power, Control, DC supply Cable and Signal Cables are to be laid as per identified cable tray. In case of non-availability of cable tray, cable shall be laid with permission of BHEL.

2.12.7 Laying, etc. of Optical fibre cables on cable trays/ cable trench shall necessarily be done using flexible conduit.

2.12.8 Damaged cable drums also to be used within the quoted rates. No extra compensation for difficulty in cable laying due to damaged drums shall be made.

2.12.9 Entry to the panels and JBs may be at top, sides or bottom. All cables are required to be properly supported and clamped near to the JB/ Panel.

2.12.10 Spare holes in the panels/ Instruments/ Actuators/ Motors/ JBs/ etc. shall be sealed by the contractor using suitable method (The cost of work and Materials such as aluminium sheet or Adhesive tape/ Plugs etc. shall be within the quoted rates for laying of cables).

2.12.11 Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rate of cable laying.

2.12.12 Copper tinned lugs of various types (pin, ring, fork, snap-on) up to 4 sqmm conforming to IS: 694, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/ metallic as per site requirement, clamping and dressing material such as suitable cable ties/ clamps (25 x 3 mm Aluminium Flat) etc. with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. Single core power cable shall be laid in trefoil formation. The quality of material shall be approved by BHEL engineer prior to their use on the job.

2.12.13 All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation.

2.12.14 Cable shielding – all signal cables are supplied with bare shielded copper wire/ with braided wire shield. Generally, shield wire is kept isolated at instrument/ field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing.

2.12.15 Wherever cables run through ducts, conduits, valves, etc., they shall be sealed using fire/ weather proof compound. In addition to this, cable entry in panels, MCCs, instruments, electrical actuators etc., are also required to be sealed. The required material for doing so shall be included by contractor in the cabling scope.

2.12.16 Many of the cable trays and cables have to be laid in cable trenches. For this purpose, the covers of the trenches have to be opened for working at site and whenever the cables are to be laid in existing cable tray, all safety precautions have to be observed.

2.12.17 After completing the work, the trenches have to be cleaned and covers put back into position. Contractor shall also carry out de-watering from the trenches if required and arrange pumps etc., at his cost.

2.12.18 Looping wire at terminal block of panels and electrical actuator as shown in the inter-connection diagrams or as required, is to be done by contractor at no extra cost.

2.12.19 Contractor shall carefully plan the cutting schedule of each cable drum in consultation with site engineer such that wastages are minimized. In any case, the wastage shall not exceed the limits mentioned in this contract. Recovery will be made in case the wastages are exceeding the wastage allowances fixed in this contract.

2.12.20 In case of HT cable, cutting schedule is to be followed as provided by BHEL.

2.12.21 The HT/ LT Power and control cabling work shall be carried out in advance so that same can be terminated at panel end as the clearance is ready from the panel E&C side.

2.12.22 The termination and connection of cables shall be carried out strictly in accordance with manufacturer's instruction, drawings, and/ or as directed by the BHEL. The work shall include all clamping, fitting, fixing, soldering, tapping, compound filling, cable jointing, crimping, shorting, and grounding as required for the complete job. Cables shall be checked for insulation resistance before and after jointing. All erection consumables shall be in Erection Agency's scope. Termination and connection shall be carried out in such a manner as to avoid strain on the terminals. Cables shall be marked with cable numbers as per applicable drawing.

2.12.23 Control cable cores entering control panel/ switchgear/ MCC etc. shall be neatly bunched and served with PVC perforated tape to keep it in position at the terminal block.

2.12.24 Cable glands and lugs are being supplied along with corresponding equipment like Motors, LT Switchgear, Junction Boxes, PB stations, and transformers etc.

2.12.25 Termination and connection shall be carried out in such a manner as to avoid strain on the terminals. Cables shall be marked with cable numbers as per applicable drawing.

2.12.26 All cable entry points shall be properly sealed and made vermin proof and dustproof. Unusual opening, if any, shall be effectively closed. Sealing work shall be carried out with approved sealing compound having fire withstand capability for at least 03 hours.

2.12.27 The rate of laying for LT power, control and signal cable is inclusive of glanding and termination at both ends.

2.12.28 The LT Power, Control and Signal Cable straight through Jointing Kits (if required) shall be in Contractor's scope of supply. The rate of supply, and erection of these kits will be part of laying rates. No separate rate is applicable on this account.

2.12.29 The unit rates for the HT cable termination are exclusive of unit rates for laying of HT cables. termination kits for HT cables (3.3kV and above) shall be supplied by BHEL.

2.12.30 Ferrules shall be installed on all control cables cores in all junction boxes and at all terminations. The ferruling shall be cross ferruling. The ferrules shall carry terminal numbers as per drawings. All ferrules shall be coloured, plastic & interlocked type. Spare cores shall also be similarly ferrules, crimped with lug and aped on the ends. Spare cores shall be ferruled with individual cable number, crimped with lug and aped on the ends.

2.12.31 Terminal Connections: The types of cable terminations are generally as detailed below:

a. All JBs are both side screw type.
b. All console tiles wiring: screwed or plug-in type to be fabricated at site.

2.12.32 For removal of existing Cables, Cable Induction meter of applicable Voltage is mandatory to confirm that the cable is charged or not.

2.12.33 Unit rate quoted for cable lying shall include the activities as defined above.

2.13 JUNCTION BOXES/ PUSH BUTTONS

Different types of junction boxes are to be erected by the contractor like junction boxes below 48 ways and above 48 ways. The junction boxes are to be located at the locations jointly decided at site during erection. The junction boxes are to be erected on the frames fabricated at site. Brief work will include:

a. Checking of installation for correctness.
b. Functional checking/ adjustment of JB/ PB for their system.
c. Hardware for erection (Like Nuts, Bolts and Washers etc.) where ever is required shall be in the scope of the contractor.

~~2.14 LAYING OF PIPES AND TUBES (IMPULSE PIPE & INSTRUMENT AIR PIPE)~~

~~2.14.1 Root valves are generally provided on process pipe line by other agencies. Prior to starting impulse pipe, contractor to identify the process point with respect to PIDs.~~

~~2.14.2 Installation of impulse pipe of CS/ AS/ SS material shall include cleaning, air flushing, cutting to length from running meter, edge preparation, cold bending, welding of sockets/ reducers/ tee/ cross/ isolating valves/ union, nut and tail pieces/ nipples, condensing and other pots,~~

~~etc., mounting of SS/ CS valve manifolds and compression fittings, providing supports, clamping, conducting leak test/ hydraulic pressure test, conducting RT/ UT and painting (refer relevant clause of TCC for details) .~~

~~2.14.3 Piping works shall involve either arc or TIG welding. Contractor to follow the BHEL supplied welding schedule and welding procedures. The decision of BHEL engineer will be final in this regard.~~

~~2.14.4 IBR certified welders shall be deployed for welding of impulse pipe and contractor shall take approval for welder and welding consumables from BHEL site engineer.~~

~~2.14.5 Laying of GI pipe for instrument airline shall include air blowing, cutting from the running meter length, threading, installation of elbows/ tee/ reducer/ moisture traps/ auto drain pot/ check valves/ isolating valves, supporting clamping, conducting leak test and also seal welding of threaded joints, if required.~~

~~2.14.6 Threaded joints of airline shall be made leak proof by using Teflon tapes or sealing compound. All consumables (for leak proof) shall be in the scope of contractor.~~

~~2.14.7 All fittings and accessories for impulse pipe and airline shall be provided by BHEL. Quoted rate for piping shall include cost of installation of such fittings and no separate rates are envisaged.~~

~~2.14.8 Contractor shall provide GI "U" clamps for impulse pipe and GI pipes within the quoted rates for installation of the same.~~

~~2.14.9 Impulse pipes shall be painted.~~

~~2.14.10 Installation of Copper tubes/ SS tubes/ copper pipes shall include cutting into required length, laying, bending, cleaning, brazing wherever required, fixing of brass fittings like compression fittings/ tees/ end connectors/ straight connectors/ bulk heads/ valves etc., supporting clamping including supply of clamps and hardware, flushing and conducting leak test.~~

2.15 STRUCTURAL STEEL FABRICATION AND INSTALLATION (Instrument/ Junction Box Frame/ Panel Base Frame/ Cable Tray & Misc. Structures Fabrication)

2.15.1 Structural steel material like MS angles, channels, beams, flats, plates etc. shall be supplied in running meter and the same shall be used for misc. fabrication if required and for fabrication of Local Instrument Racks, panel base frame, cable tray supports, Canopies for instruments/ panels/ drives/ JBs/ Push Buttons etc., Instrument/ Junction box frames, Impulse Pipe/ Instrument Air Pipe supports and instruments etc.

2.15.2 This shall include cutting to size, contouring of ends for connections if required, welding, grinding of excess weld deposits/ burrs, drilling of holes for mounting of device/ instrument, installation at location, levelling, alignment, providing bracings and painting etc. No gas cut holes will be permitted. Contractor to follow the BHEL supplied welding schedule and welding procedures.

2.15.3 In case, structural cable trays, bends, tees, reducers etc., are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instances.

2.15.4 Frame installation/ cable tray accessories' installation at site may involve mounting either on concrete floor by grouting/ using anchor fasteners or on steel structure by welding etc. All consumables including anchor fasteners shall be arranged by the contractor. Where required, as part of work, concrete floors may have to be chipped out to reinforcement depth for anchoring the frames. Wherever grouting is required, contractor shall arrange all the required material including cement/ grout mix, shuttering etc., necessary labour and meet all other requirements as part of work.

2.15.5 In certain packages, galvanized members of junction box frames and instrument racks shall be supplied in cut to sizes and frame assemblies are required to be done as per drawing by bolting/ welding. The installation rate as quoted shall include the assembling of the frames.

2.15.6 In certain packages, members of frames/ rack for mounting of junction boxes/ instruments may be supplied readymade. These have to be assembled prior to installation. The installation rate as quoted shall include assembly of the frames.

2.15.7 Gas cutting of tray/ impulse pipe support and holes in frame is not permitted. Only hacksaw cutting/ drilled hole shall be permitted.

2.15.8 All the fabricated supports/ frames for instruments, brackets/ racks, support steel work for tubing impulse lines/ instruments trays, pipes, electrical equipment, etc., shall be epoxy painted after shot blasting (as applicable) and surface preparation as per painting specifications. Paints and other associated items are in the scope of the contractor.

2.15.9 Hardware for erection (Like Nuts, Bolts and Washers, etc.) where ever is required shall be in the scope of the contractor.

~~2.16 METAL CHANNEL FLEXIBLE BOLT-ABLE CABLE SUPPORT SYSTEM~~

~~2.16.1 Flexible GI cable support system, consisting of single/ double channels, base plates, and cantilever arms. Wherever necessary, the base plate beam clamps will be supplied for bolting. Otherwise, the base plates are to be welded to the racks or beams if necessary at 90°.~~

~~2.16.2 Angle fittings, flat plate fittings, clamps for single & double channels, fasteners etc. will be supplied for fixing trays and cantilever arms and for this no separate erection charges will be paid. Rates shall be inclusive in quoted rates for erection of support channel and cantilever arm.~~

~~2.16.3 Metal channel bolt able GI cable support shall be supplied. Each cable rack assembly comprises of sub components such as single or double channel, base plate for single/ double channel, angle fitting, clamps, cantilever arm, anchor fastener, associated hardware (spring loaded nuts, bolts and washers) etc.~~

~~2.16.4 Channel shall be supplied in standard length of six meter. Contractor shall cut the channel and assembly the rack as per site requirement. Cantilever arm is to be fixed on channel support with spring loaded nuts/ bolts as per installation drawing.~~

~~2.16.5 Base plate/ angle fitting shall be continuously welded all around to steel members/ plate insert if provided. Brackets/ clamps shall be welded to steel surface with channel as applicable in position to ensure alignment of clamps/ channels. Weld thickness shall be 6 mm minimum. In case steel surface in not available for welding, anchor bolts are to be used for fixing the base/ angle fitting.~~

~~2.16.6 Main support for longitudinal cable tray run in the cable vaults shall be fixed at both ends at top as well at bottom as out lined above.~~

~~2.16.7 Galvanisation damaged due to welding/ cutting shall be re-painted with cold galvanising paint (supply of paints is in contractor's scope).~~

~~2.16.8 Unit rate for "Single/ Double Channel" shall include cutting channel in required lengths, fixing of angle fittings/ base plate/ clamps/ brackets/ fasteners/ cantilever arms/, welding etc. as required as per type of installation.~~

2.17 INSTALLATION OF PANELS (STARTER PANEL/ LOCAL STARTER BOX/ POWER DISTRIBUTION BOX/ MARSHALLING BOX/ CONTROL PANELS)

2.17.1 Electrical control panels, electronic control panels, 415-volt LT MCCs etc., are normally supplied in suite of either one/ two/ three or loose shipping sections with integral base frame or loose base frame. These panels may have to be installed as stand-alone or in-group consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

2.17.2 The panels shall be transported from stores to the place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc. mounted on the panel do not get damaged during transit.

2.17.3 Installation of panel shall include fixing of base frame, levelling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubical interconnection hardware, interconnection of bus bar/ bus bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates, sealing of panels/ cable entries. Where the base frame is not supplied as part of panel supply, the contractor shall fabricate the base frame from structural items at site. Payment for such fabrication will be effected on measured quantity at the rate applicable

for structural steel fabrication and installation. Proper sealing of all the holes and cable entries (even if the cable has been laid by others) in the panel is in the contractor's scope.

2.17.4 Minor civil works like drilling, chipping, punching holes and opening in concrete floors, slabs and brick walls, grouting, related to Rack, support installation, minor civil works required for installation of control panels, Junction boxes etc., shall be included in the erection cost of such items. Also all miscellaneous civil works like chipping away and making good as necessary in floor slab/ wall for cabling/ earthing etc., as required are included in the scope for which no separate payment is applicable. The scope also includes supply of grouting material, if any.

2.17.5 Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. This shall be a part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panels have to be erected at different locations and elevation in depending on the detailed engineering.

2.17.6 Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/ moisture and rainy water. This will have to be periodically cleaned and surroundings have to be kept tidy.

2.17.7 Whenever the panels are to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication & installation rate shall be applicable.

2.17.8 Normally the panels shall be supplied with instruments, relays, meters, electronic modules, contactors, push buttons, etc. mounted and pre-wired. However, if these are supplied loose/ separately for safety in transit, contractor shall mount and wire such devices as part of the panel installation work and no separate rates shall be applicable unless otherwise specially listed in the rate schedule.

2.17.9 Supplier's instruction manuals, packing slips, door keys etc. received along with the panels will be handed over to BHEL's engineer on opening of the panels and record of receipt of such things shall be maintained by contractor.

2.17.10 Regular cleaning of the panels as per the instruction of BHEL engineer till handing over of the set to customer is to be carried out by the contractor free of cost.

2.17.11 No separate payment shall be made for replacement of any devices like electronic modules, relays, conductors, terminal block, push buttons etc. which are found defective during pre-commissioning/ post-commissioning of any equipment/ item.

2.17.12 For the panels erected by other agencies, commissioning/ calibration work and troubleshooting has to be carried out by the contractor as part of testing and commissioning work as per the quoted rates.

2.17.13 Interposing Relays (24/ 48 Volt DC) along with mounting base if supplied shall be supplied separately for mounting in the various feeders of 11kV/ 3.3kV HT switchgear boards and 415 Volt MCC Board for unidirectional/ bi-directional drives, solenoid valves.

2.18 CONTROL PANELS

Station C&I system panels are based on maxDNA/ metso DNA distributed digital control philosophy. MaxDNA/ Metso DNA system is having communication through UTP cables amongst themselves. The system consists of computer network with servers and workstations and various peripherals like printers, etc. Optical fiber cables are also used for communication, especially for larger distances. The various components/ devices are generally located in control room/ computer room/ diagnostic and shift in charge room. Some panels (viz. network panels) are also located in outdoor plants and other units.

The entire work of erection, testing, commissioning of the connected devices/ equipment as listed in rate schedule is to be carried out including laying of peripherals cables (either plug-in or plugs to be fabricated at site), placement of computer furniture in computer room as per lay out. The computer furniture shall be supplied either assembled or in knocked down condition, which have to be assembled at site. The quoted rate shall be inclusive of

transportation, cable laying, termination, E&C and placement of furniture (Computer tables, Computer Chairs & Printer table) against each device as given in the rate schedule.

~~2.19 BATTERY/ BATTERY CHARGER/ UPS~~

~~2.19.1 Ni-Cd/Lead Acid (or similar type) Batteries will be supplied loose along with battery interconnection in the series/ parallel links/ bus bar, lugs, steel/ wooden battery stand either assembled or knocked down condition, cables and associated charger and UPS system.~~

~~2.19.2 In case of Ni-Cd (or similar type) batteries are normally supplied in charged condition, due care shall be exercised while handling/ installation of the same. If the battery charge is found to be less than the required level, the charging/ discharging cycle shall be carried out as per instruction of BHEL engineer.~~

~~2.19.3 Battery charging/ discharging is a continuous process and skilled manpower shall be deployed by the contractor round the clock.~~

~~2.19.4 Contractor shall arrange suitable load, cables, safety equipment and consumables for discharging the battery during charging and discharging cycle at his cost.~~

~~2.19.5 Contractor shall provide skilled manpower for periodic maintenance after the battery are fully charged for the activities such as checking of electrolyte level, specific gravity, topping up with distilled water and cleaning till the set is handed over to customer and record of the same shall be maintained and submitted before handing over of the system.~~

2.20 FIELD INSTRUMENTATION

2.20.1 Various type of primary/ secondary indicating/ recording instrument for pressure, temperature, flow, level and analytical measurement shall be supplied either loose or mounted along with the equipment.

2.20.2 Scope of work under erection/ calibration/ testing/ commissioning shall include calibration, setting, adjustment, writing instrument tag number with paint, report making, installation, servicing, minor repairs/ servicing, putting instrument into service, signal checking from field up to the functional group panels and remote indicating instrument, functional checks, interlock and protection/ alarm checks by simulating the field devices, troubleshooting during pre-commissioning/ post-commissioning till system is handed over to the customer.

2.20.3 It is the responsibility of contractor to make erection, calibration/ testing protocols for various C&I equipment/ devices and they should get duly certified by Customer/ BHEL engineer and should be submitted to BHEL engineer regularly. However, sample formats will be given by BHEL and have to be printed by contractor in adequate numbers.

2.20.4 Contractor shall establish calibration laboratory with adequate facilities and they should arrange standard test instruments duly calibrated from recognized agencies and calibration report of the same to be submitted prior to start of calibration of the field instruments/ devices.

2.20.5 Installation of instrument shall also include drilling of holes and tapping for mounting of instrument and local instrument frames/ panels and supply of hardware for mounting of the instrument.

2.20.6 Some devices like solenoid valves, position feedback transmitters, limit switches, air filter regulators etc., are supplied assembled along with mechanical equipment like pneumatic control valves, trip valves, dampers, motorized actuators, etc. These will need removal, calibration/ testing, re-fixing, adjustment, etc., and commissioning. Separate payment shall not be made for this. The rates quoted for the commissioning of these equipment (viz., pneumatic control valves, trip valves, dampers, etc.) should take care of the above. Also, the contractor shall remove such devices prior to erection either at site or at store to avoid damages/ pilferages and keeping in safe custody and the same shall be installed prior to commissioning of such equipment.

2.20.7 Transmitter enclosure/ open racks (LIE/ LIR) for various packages which are to be erected and commissioned at various locations of the turbine and outdoors, shall be supplied with internal tubing, air filter regulators, rotameters, provision of continuous or intermittent purging arrangements wherever required, etc. The quoted rates for these racks/ enclosures

shall include the erection and commissioning of all such items inside these racks/ enclosures.

2.20.8 Sometimes recalibration of equipment may become necessary due to reasons not attributable to the contractor, e.g. Lapse of Time after first calibration, Need for change in range/ parameter, etc. If re-calibration is required due to no fault of the contractor, the rates payable for re-calibration shall be as under:

Recalibration Charges = 60% of the Percentage Stage Payment for Calibration as per split-up defined in Terms of Payment

The contractor shall keep record of such instrument with the reason for re-calibration and certified by the BHEL Engineer.

Note: For recalibration of skid mounted items or other systems where lump sum rates are quoted, the recalibration charges, if admissible, will be calculated from the relevant unit rates quoted for same/ similar items elsewhere in the rate schedule. The decision of BHEL Engineer shall be final and binding on the contractor.

2.20.9 For the very few cases where required, the contractor shall carry out re-orientation of bottom/ top entry arrangement for process connection if needed due to site condition in existing instrument rack/ enclosure/JB and re-location of existing instrument including removing of the existing tubing and re-installation of the same at appropriate location due to any change in grouping of the instrument and no extra payment shall be applicable.

2.20.10 In certain cases, instruments/ devices are supplied on equipment or drawn by other agencies as part of mechanical package. The same are to be received or to be collected from other agencies for keeping in safe custody to avoid damages. The same are to be erected back after calibration for which unit rate shall be applicable for erection and calibration. Contractor shall maintain record of such instrument duly certified by BHEL engineer. However, for removal of such instrument, no separate rate/ payment shall be applicable.

2.21 UNIT CONTROL DESK AND COMPONENTS

2.21.1 Unit control desk will be supplied in a single shipping section for erection at site.

2.21.2 Console Inserts shall be supplied either mounted on console grid or supplied loose. Also, the items (indicators, pushbuttons, etc.) of the console insert may be supplied mounted in the console insert or may be supplied loose. The lump sum rates quoted for console inserts should take the above into consideration. No separate payment will be done for the erection of individual components of console inserts. However, for the other items like recorders, indicators, etc., unit rate shall be applicable. Alarm facia on the control desk may be supplied mounted or loose. Mounting these, if required, will not attract any extra payments. The commissioning of these will constitute a part of the panel commissioning from where the alarm is driven.

2.21.3 Wherever control desk/ panel is not supplied by BHEL or is in customer scope of supply and installation, loose item supplied by BHEL if any, shall have to be mounted by the contractor.

2.21.4 Console/ console tiles shall have plug-in/ screwed/ soldering/ crimp snap-on, connection. Interconnecting cable between console and process control panel shall be either of pre-fabricated plug-in cable or plugs are required to be made at site with crimp insertion type of pins. BHEL shall provide plugs and any special lugs at free of cost. However, other ordinary lugs required for the work shall be arranged by contractor.

2.21.5 Generally, 0.5 sq.mm multi pair shielded cables are envisaged for console cabling. Cable may have to be terminated at different console tiles, spliced wire of individual cable need to be routed through PVC sleeves up to the plug end of the tiles.

2.22 MISC. OTHER INSTRUMENT/ EQUIPMENT ERECTION, CALIBRATION AND COMMISSIONING.

2.22.1 Wherever panels & control valves have been erected by the mechanical contractor, calibration/ commissioning has to be carried out by the contractor.

2.22.2 Dimension and weight as mentioned against control panels, MCCs, etc. in rate schedule are only approximate and there may be changes in dimension and weight in actual supply of the equipment and no rate variation shall be applicable on this account.

2.22.3 Wherever brief description of the system is given under various sub-heads, it is only for the understanding system requirements. It does not indicate the total specification of work. For such system, other clauses are also applicable wherein work details are specified.

2.22.4 Normally, cable glands on junction boxes side are received in mounted condition. While terminating the cables as per drawings, the cable glands are to be removed and fixed. Wherever cable glands are not received along with junction boxes, the cable glands as per the requirement will be provided by BHEL and the contractor has to make necessary holes/ adjust the available holes in the JB for fixing these. No separate payment will be made for drilling of holes and fixing the cable glands to the junction boxes. Nameplates for JBs will be supplied separately. These are to be suitably written and fixed onto the JBs. Wherever nameplates for JBs are not supplied, the JB no. are to be written with paint on JBs for identification. Separate payment will not be made for this.

2.22.5 The push buttons and indicators in C&I systems are provided as loose with different type of connectors. The fixing of connectors and their wiring from push buttons to indicators shall be the responsibility of contractor. No separate payment will be made for fixing of connectors. The cable laying and termination charges will be paid as per applicable rate schedule.

2.23 GUIDELINES FOR ERECTION

~~2.23.1 Impulse Pipelines~~

~~a. All impulse lines, air lines shall be thoroughly cleaned by removing the dust, burrs etc., and any foreign matter inside the pipe/ airline is to be cleaned by compressed air or any other suitable means before installation.~~

~~b. The routing of pipe lines shall include sufficient flexibility near tap off points to allow for thermal expansion of process equipment.~~

~~c. The pipes shall be cold bent using hydraulic bending machines only.~~

~~d. The horizontal impulse lines shall be laid with proper slopes towards the tapping point. Two root valves are to be used wherever pressure is more than 40 kg/cm2 or Temp>280 °C .~~

~~e. Supports for piping and tubing shall be adequate and in no case exceed limits shown below: -~~

~~1~~	~~1/2" NB pipe/ tube~~	~~5 ft.~~
~~2~~	~~3/4" NB pipe/ tube~~	~~5 ft.~~

~~f. All CS impulse line welding shall be done through welding generator/ rectifier and only structural welding may be done with welding transformer.~~

~~g. Impulse pipes of alloy steel/ SS/ carbon steel etc. shall be TIG welded. Contractor shall arrange for necessary TIG welding sets, electrodes etc.~~

~~h. Minimum number of fittings shall be used on all lines wherever possible, to keep threaded joints to a minimum wherever threaded connections are to be made.~~

~~i. Testing~~

~~On completion of pipeline installation, the pipelines shall be hydraulically tested. Contractor shall arrange for water filling pump, hydraulic test pump and standard gauges and conduct the test satisfactorily.~~

~~j. The impulse lines shall be isolated from instruments and tested at 2 times the maximum working pressure. The fall in pressure shall not be more than 1 kg/cm2 or 1% of the working pressures whichever is less, in 30 minutes and there shall be no leaks at any of joints/ welds when isolated from source of pressure.~~

~~k. All weld joint in CS, SS, AS (High Pressure) line are subject to 100% radiography test with minimum two shots per joint.~~

2.23.2 Air Piping

All instrument air pipelines shall be isolated from the instruments and pressurized pneumatically to maximum work pressure. They shall then be isolated from the source of pressure and fall shall be less than 1 psi in 20 minutes.

2.23.3 Pneumatic Signal Lines

All pneumatic signal lines shall be disconnected and blown through with instrument air. The line shall be blanked off and pressurized pneumatically 20 psi and checked with soap solution for leaks and attended accordingly.

2.23.4 Instruments and Equipment

a. All field mounted instruments are to be located in such a way as not to obstruct walk-ways or plant equipment access but shall be easily accessible for maintenance. Hand rails shall not be used for mounting or supporting instruments.
b. Racks/ stands and supports for instruments and transmitters shall be fixed on RCC column/ floor by chipping and grouting or by welding to steel structure. In no case these shall be welded to floor grills.
c. When installing flow and pressure transmitters/ switches for Liquid/ steam/ condensate vapour services, the instrument is to be mounted below its primary element or tapping point. For gas service applications, the instrument is to be mounted above Primary element tapping point.
d. During erection and commissioning stage, the site mounted instrument shall be protected suitably. Contractor shall provide suitable security arrangement in main control room, and other areas where equipment are positioned, at no extra cost.
e. Contractor shall arrange for own firefighting equipment for the materials stored under contractor's custody.

2.23.5 Sub-assemblies

a. All subassemblies should be kept in a separate place where it is easily accessible.
b. Subassemblies should have a protective cover in case it is stored without wooden packing/ case to prevent accumulation of dust. Silica gel packets should also be kept along with it.
c. Subassemblies should not be stacked one above the other.

2.23.6 Loose items

The loose items supplied for the main equipment falls into various categories like tools, cables, prefabricated cables, console inserts, recorders, VDU/CRT, other display units, printers, sensors and transducers, cable glands, cable ducts, frames, racks, etc. These are to be categorized and stored separately.

2.23.7 Guidelines for handling of electronic modules

a. All the electronic modules shall be handled by qualified persons only.
b. Electronic modules should only be touched when it is absolutely essential to do so.
c. Before touching any electronic module, the operator should discharge the static electricity by earthing himself or better still, ensure constant discharge by wearing an earthed wrist strap.
d. The operator should not wear clothing made entirely from synthetic fibres, but a mixture containing at least 65% cotton.
e. The PCB should always be held by front panel or by module frame and electronic components/ connectors should never be touched.
f. The electronic modules should not be placed close to television sets or CRT units.
g. Soldering irons and any other tools used must be grounded.
h. All modules using CMOS components are packed in antistatic bags when transported loose to avoid ESD failures. The antistatic bags must always be used to transport modules at site from one place to the other.

2.23.8 Welding, Non-destructive testing etc.

a. Installation of equipment involves good quality welding, NDE checks etc.
b. Welder deployed for aluminium welding shall have experienced and approved by BHEL and BHEL's Customer after due qualification process/ testing.

c. Welding of all structural steel & aluminium shall be done only by the qualified and approved welders.
d. All the welders shall be tested and approved by BHEL engineer/ Customer's quality engineer before they are actually engaged on work though they may possess IBR/ other certificate. BHEL reserves the right to reject any welder without assigning any reason.
e. The welded surface shall be cleaned of slag and painted with primer paint to prevent corrosion. For this paint will be supplied by the contractor.
f. Welding electrodes have to be stored in enclosures having temperature and humidity control arrangement. This enclosure shall meet BHEL specifications.
g. Certain types of coated welding electrodes, prior to their use, call for baking for specified period and will have to be held at specified temperature for specified period. Also, during execution, the coated welding electrodes have to be carried in portable ovens.

2.24 ELECTRICAL CABLING, EARTHING AND ABOVE GROUND EARTHING

2.24.1 ELECTRICAL CABLING/ WIRING

a. All the cables will be properly laid in cable trays, dressed and clamped with aluminium flats. The cable will be terminated at both ends with suitable lugs and printed ferrules and will be glanded properly. Suitable equipment and consumables for ferrule printing has to be arranged by the contractor at his own cost. For cable identification, the contractor shall provide at his cost aluminium tags at regular intervals (as per cable schedule) through each run of cable.
b. All electrical connections shall be tested for polarity and proper connections.
c. Insulation test of the various circuits shall be done.
d. The checking of operation of individual equipment and instruments to which the cabling/ wiring connected shall also be done by the contractor.
e. Wherever supplied, GI cable trays shall be of bolted construction only with fixing screws and coupler plates.
f. Sharp bends of cable trays shall be avoided in all type of cable trays.
g. Installation of cable racks and supports structure shall be carried out in all the required areas. Steel embedment shall be provided in the cable trenches, ceiling slabs and concrete blocks for installing the cable racks and support structures.
h. Ladder perforated type cable trays shall be used in cable trenches and vertical risers.
i. Perforated cable trays shall be used in higher elevations in Boiler and Generator area.
j. Cable racks in the trenches and control room are to be shared with other contractors installing cables in different areas wherever required. Contractor shall cooperate with the other contractors in sharing the cable trays and proper dressing and clamping the cables.
k. Where power and control cables are to be laid in the same route, suitable barriers to segregate them physically shall be employed.
l. Space equal to the diameter of cable shall be provided between power cables of six over 50 mm in diameter.
m. When cables pass through floors, walls etc., it shall be passed through a pipe for mechanical protection and the pipe ends sealed suitably.
n. Care shall be taken to avoid short bending and kinking of conductor damaging insulation and stressing the cable beyond pulling force recommended by the manufacturer. Cable shall be protected at all times from mechanical damage.
o. The minimum radius of formed bend of an insulated cable shall be 12d for un-armoured cables and 15d for armoured cables where 'd' is the overall diameter of the cables.
p. No cable shall be laid in ducts or trenches where other services such as oil pipes, steam or water pipes are laid.
q. Where cabling passes through brickwork or concrete work, the contractor shall provide suitable local protection against mechanical damage wherever necessary.
r. The layout of all cables shall be arranged to give adequate clearance from other services and cables shall be routed to avoid hot zones. No extra cost shall be considered for rework.
s. Jointing of cables shall be avoided as far as practicable. However, jointing if at all necessary shall be done by crimping type cable joints after getting approval of BHEL engineer.

t. The cable schedules indicating cable sizes, tentative cables routing information will be furnished by BHEL at site to the contractor. Required steel inserts on cable trenches, will be provided by BHEL. The contractor shall design number of cable/ racks to accommodate the cables on racks/ trays properly.

u. Detailed specification shall be as per instruction of site engineer.

2.24.2 EARTHING INSTALLATIONS

a. All equipment shall be earthed by two separate and distinct connections. Earthing terminals will be available in all equipment supplied by BHEL.

b. The earthing conductors shall be of mild steel/ GI strip/ wires. All connections from equipment to main earthing conductors shall be made as illustrated in earthing drawing/ as per instruction of BHEL engineer. Suitable "Cu" Lugs are to be supplied for earthing with GI wire by the agency where ever is required.

c. A continuous earthing conductor shall be installed in all cable trays and securely clamped to each tray section by suitable connectors to form a continuous earthing system. When two or more trays supporting power cables run in parallel, a continuous earthing conductor shall be provided on trays only with tap offs to the control cable trays. All valve and damper motors and rapping motors will be earthed to this conductor.

d. All joints in the earthing system shall be welded type. Earthing connections to all equipment including motors shall be bolted type.

e. Earthing connections shall be free from tinning scale paint, enamel, grease, rust or dirt at the time of making joint.

f. Metallic sheaths, screens/ shields and armour of all multicore cables shall be bonded and earthed.

g. Earthing conductors along their run on columns, beams, walls etc. shall be supported by suitable cleats at intervals as specified by BHEL site engineer.

h. Welded joints on GI earthing conductors shall be painted as mentioned in the Typical Arrangement drawing.

2.24.3 ABOVE GROUND EARTHING

a. The contractor shall carry out above ground earthing for all Electrical equipment, which may be erected by him, or some other agency. Different type of earthing materials shall be supplied and the contractor shall lay and connect the earthing materials as per site requirement and as detailed in drawings. Unit rate for earthing material shall be paid on running meter basis.

b. All equipment shall be earthed by two separate and distinct connections. Earthing terminals will be available in all the equipment supplied by BHEL.

c. Parts of all electrical equipment and machinery not intended to be live shall have two separate and distinct earth connections each to conform to the stipulation of the Indian Electricity Rules and apparatus rated 240V and below may have single earth connections.

d. Generally, risers are provided near the structure/ equipment foundation, in case risers are not visible and buried below the foundation level, contractor shall carry out necessary earth excavation for connecting the above ground earthing strips. Wherever welding is involved necessary protective coating shall be applied on weld joints.

e. The earthing conductors shall be mild steel/ G.I. strips/ wires. All connections from the equipment to the main earthing conductors shall be made as illustrated in earthing drawings. A copy of earthing drawing shall be provided to the successful bidder.

f. A continuous earthing conductor shall be installed in all cables trays and securely clamped to each tray section by suitable connectors to form a continuous earthing system. When two or more trays supporting power cables run on parallel a continuous earthing conductors shall be provided on one tray only with tap-offs to the control cable trays. All valve and damper motor and rapping motors will be earthed to this conductor.

g. If the equipment is not available at the time of earthing conductor laying tap connections from the main earthing conductor shall be brought out up to slab equipment foundation level with at least 200mm spare length left for further connections to equipment earthing terminals.

h. Entire system shall be earthed in accordance with the provisions of the relevant IEC recommendations/ IS code of practice IS 3043-1947 and further amendments thereof and Indian Electricity Rules, so that the values of the step and contact potentials in case of faults are kept within safe permissible limits.

i. If any outer shops and buildings as well as the electrical sub-stations and electrical rooms are also in contractor's scope, a ring main earthing system will be provided. Ring main earthing systems shall again be interconnected as a network to power plant main earthing mat. Internal earthing ring in the electrical equipment room shall be provided by the contractor irrespective of whether equipment of the area is in their scope or not.

j. For different floors in a building, localized internal earthing ring shall be formed and connected to the ground earthing through vertical risers. The earthing mat shall be common to both power and lighting installations.

k. A minimum of two spare earth rings will be provided in each floor of the building for earthing future building.

l. Each RCC steel column of the building will be interconnected to the floor-earthing grid in basement/ ground floor.

m. For protective earthing separate conductor shall be used for flow of earth fault current.

n. Contractor shall carry out minor civil i.e. chipping of floor (where earth strip is to be laid on floor), removal of topsoil for laying earth strip in switchyard area, etc.

o. It is the responsibility of contractor to provide skilled manpower for periodic maintenance after the initial commissioning till handing over the system to customer. During this period the activities are to be carried out such as checking the electrolyte & specific gravity of individual battery, topping up of electrolyte, cleaning etc.

2.25 TRANSFORMERS

Different types of transformers like dry type shall be supplied as indicated below. Dry type service transformer will be located adjacent to their respective location/Service building.

SERVICE TRANSFORMERS

6.6/0.433kV, 1600 kVA, Dry Type-4 no.

The scope of work under this head is defined as below.

a. Contractor shall transport the transformer tanks & accessories of LT power transformer and other transformers as mentioned above from BHEL stores/ Storage yard to respective foundation of unit.

b. The transformers shall be handled in such a manner so that no jerk is transferred to the core, winding and internals of the transformer.

c. Transformers are generally supplied in partly assembled condition. Accessories, like radiators, conservator tank, pipes, fittings, hardware's, gaskets, buchholz relay, marshaling box, relief vent, valves, pumps, cooling fans, cables, bushings, radiator headers/fans, rollers, tap changer drive unit, cables of various sizes for interconnection from marshaling control box to field devices, bushing turrets (as applicable) shall be supplied loose.

d. Placement on plinth, alignment with respect to the foundation and lay out drawings.

e. Internal inspection to verify the intactness of core and winding, tap changer leads, off-load switch/on load tap changer, measurement of core and core bolt insulation.

f. All the accessories shall be assembled/ mounted as per OGA drawings and these should be thoroughly cleaned by spirit prior to installation.

g. Contractor shall arrange required testing equipment for carrying out electrical test like voltage ratio, turn ratio, vector group, magnetic balance, winding resistance measurements, insulation resistance, Resistivity, SFRA and TAN Delta Test etc. as applicable.

h. Contractor shall discuss and finalize installation and testing activity procedure with BHEL/customer prior to starting the work.

i. Tests are also required to be conducted on Current Transformer, Potential Transformer & prior to /after installation. Contractor shall also carryout oil processing / filtration to achieve the desired results before charging and handing over of the entire system.

j. Internal inspection on receipt of Transformer at site in presence of supplier is made mandatory. There may be time gap between first inspection and second inspection (which may be just before assembly of transformer accessories). If applicable, Nitrogen cylinders of appropriate purity shall be arranged by contractor as a part of scope of work within the quoted rates for transformer.

2.26 6.6kV HT SWITCHGEAR, 415 VOLT LT SWITCHGEAR

GENERAL

a. Erection of the concerned switchgear.
b. Checking of installation for correctness.
c. Mechanical functional checking/ adjustment of individual breaker.
d. Measurement of Insulation resistance of individual breaker, complete switchgear board and combined insulation resistance of individual breaker with cable connected to drives.
e. Testing of Relays, Power transducers, Energy Meters, Ammeters, Voltmeters, Power factor, frequency, tri-vector meters & metering, etc. in static & dynamic condition relay.
f. Checking of electrical control & protection interlock of individual breaker and integration with other system.
g. Calibration of energy meters, tri-vector meters, voltmeters, ammeters, power current & voltage transducers, etc.
h. Provide assistance for checking the electrical operation of individual breakers from remote panels/ MMI package (maxDNA system).

2.27 ELECTRICAL ACTUATORS

The scope of Testing and Commissioning of electrically operated actuators for valves, dampers, gates, soot blowers etc., will include meggering, providing loop wire on actuator terminal block, adjustments of mechanical/ electrical or electronic position transmitters, setting of limit/ torque switches, cable checking, internal wiring checking, local/ remote operation from MCC & MMI package (maxDNA system), replacement of limit/ torque switches if required.

2.28 PLANT ILLUMINATION PACKAGE (STATION LIGHTING)

a. Station lighting covers the complete FGD area with handling, transportation from BHEL stores / yard to work place. Erection & Commissioning of lighting material like LDB (Including Lighting transformer for AC /DC) Type, LP, lighting luminaires (with Complete accessories), Switch Boxes, Junction Boxes, Receptacles, Ceiling Fan, Emergency lighting, Poles, Conduits, Rigid/Flexible PVC coated conduit, Wires, structural Steel, Hume Pipe, ~~High Mast,~~ cabling in Tray and Underground excavated trench, earthing above and below ground, earth pit for poles and ~~high mast~~ as per the drawing, etc.
b. All measuring and testing instruments required during erection, testing, commissioning and performance testing shall be arranged by the bidder.
c. Supply of necessary hardware such as double compression cable glands, conduit fittings viz. couplers, elbows, bends, tees, circular boxes, conduit accessories viz. clips, saddles, spacing plates, entry bushes, lock nuts, plugs, heavy duty lugs, ferrules, expansion fasteners, ball & sockets, earth clips, fan boxes, clamps, screws, pull out boxes etc. are in the scope of bidder. No separate rate shall be payable for the above.

2.28.1 GUIDELINES FOR LIGHTING SYSTEM ERECTION WORK

a. The contractor shall be responsible if any parts of lighting fixtures, LDBs, LPs are lost or damaged and lamps are broken during installation. All damage and thefts shall be made good by the contractor till the installation is handed over to the customer.
b. The contractor shall note that for any change in the location of lighting panels, lighting fixtures, switch boxes/receptacles, no extra charges will be paid so long as the modifications are indicated to the contractor before commencement of the work on that particular equipment or circuit.

c. The contractor shall have a separate cleaning gang to clean all equipment under erection as well as the work area and the project site at regular intervals to the satisfaction of Engineer-in-charge.
d. Except as specifically approved by the Engineer-in-Charge, installation of exposed conduits, mounting of lighting fixtures, etc. shall be taken up only after other services such as piping, air ducting, cable tray/bus duct hangers, structural bracing's etc. in a particular area have been installed
e. After installation of lighting fixtures/receptacles, panel number and circuit number shall be painted on them at a suitable place
f. Work to be in-line with drawing/design philosophy as per BHEL Engineer instruction.

2.28.2 GUIDELINES FOR LIGHTING SYSTEM ERECTION WORK.

a. The contractor shall work in co-ordination with civil, air-conditioning, ventilation & switchgear vendors. Where holes or openings in walls and floors are required for routing the conduits, the contractor shall provide the same. Cut-outs in false ceiling shall be provided by false ceiling contractor.
b. The contractor shall be responsible if any parts of lighting fixtures, LDBs, LPs are lost or damaged and lamps are broken during installation. All damage and thefts shall be made good by the contractor till the installation is handed over to the customer.
c. The contractor shall note that for any change in the location of lighting panels, lighting fixtures, switch boxes/receptacles, no extra charges will be paid so long as the modifications are indicated to the contractor before commencement of the work on that particular equipment or circuit.
d. The contractor shall have a separate cleaning gang to clean all equipment under erection as well as the work area and the project site at regular intervals to the satisfaction of Engineer-in-charge. In case this is not done, the purchaser will have the right to carry out the cleaning operation and any expenditure incurred in this regard will be to the contractor account.
e. Except as specifically approved by the Engineer-in-Charge, installation of exposed conduits, mounting of lighting fixtures, etc. shall be taken up only after other services such as piping, air ducting, cable tray/bus duct hangers, structural bracing's etc. in a particular area have been installed
f. After installation of lighting fixtures/receptacles, panel number and circuit number shall be painted on them at a suitable place.
g. Work to be in-line with drawing/ design philosophy and as per BHEL Engineer instruction.

2.28.3 Lighting Fixtures and Accessories.

a. Lighting fixtures of appropriate type as per the lighting layout drawings shall be installed by the contractor. The type of mounting arrangement of fixtures shall be selected from the typical arrangements shown in enclosed fixture mounting details drawings in section - E. The type of mounting will generally be indicated on the layout drawings. The exact mounting will, however, be decided at site depending upon the actual space/ other facilities available at site.
b. The contractor shall submit for purchaser's approval the drawings showing the detailed mounting arrangements of various types of fixtures prior to installation.
c. Wooden plugs in walls and ceilings for fixing of lighting fixtures and accessories are not acceptable. A suitable fool-proof method (preferably using nylon rawl plug) of fixing these shall be offered and this be subject to the purchaser approval.
d. The bracket for mounting the lighting fixtures on boiler platforms shall be fabricated at site using GI conduit with a reducing socket to suit the fixture and clamped to the hand rails. However, the clamping of these conduits at points of large vibrations should be avoided. The fixing shall be strong enough to withstand vibrations and wind velocity. If a roof (or other platform over the platform is available, the fixture will be pendant mounted (supported to the structural members of the platform above).

e. Flood lights shall be mounted on steel base facing the tentative direction shown on drawings. Bolts shall be tightened with spring washers. Terminals connection to the flood lights shall be through flexible conduits.

f. In the rooms where false ceilings are provided, the lighting fixtures shall be supported separately by false ceiling grid of roof over false ceiling if it is of steel structural or form ceiling and not by the false ceiling board. The arrangement shall be to the approval of purchaser. The erection rate of lighting fixtures shall include the supply of steel brackets, supporting, anchoring material, hardware and also steel brackets/hangers for bridging the gap above false ceilings, etc., required for installation of lighting fixtures as shown in the approved fixture mounting arrangement drawings.

g. A four (4) way terminal junction box type F shall be provided near each lighting fixture, for loop-in, loop-out and off connection of lighting wires or as required.

h. To distinguish emergency AC fixtures from normal AC fixtures, red painted circular mark of 1 cm dia. shall be provided on emergency fixtures.

i. The self-contained emergency lighting fixtures shall be installed in required areas. Mounting brackets are to be provided by the contractor.

2.28.4 **Lighting distribution board and Lighting Panels.**

a. Lighting DB's consisting of lighting transformer etc, shall be mounted on floor and LP's shall be mounted on the walls/columns/steel structures at the locations indicated in the drawings.

b. Suitable Space provision for LDB mounting on floor would be made by the purchaser. The contractor will supply necessary foundation bolts and do the grouting to fix up the LDBs.

c. LPs shall be installed by fastening to studs of not less than 12 mm dia. which will be suitably grouted/welded to the wall/column by the contractor. All the required accessories including studs for the erection of the panel shall be supplied by the contractor. If Mounting channels are required for, LPs the same will be provided by contractor.

2.28.5 **Lighting control Switch Boxes & Receptacle Boxes.**

a. The locations of switch/receptacle boxes will be approximately as shown in the drawings. The exact location shall be finalised by the contractor in consultation with the engineer-in-Chief.

b. All switch/ receptacle boxes in offices and control room shall be flush mounted in the wall. In other areas they shall be mounted on wall or column.

2.28.6 **Conduits and Accessories**

a. All lighting wires shall be run inside the conduit. Size of conduit shall be selected as per the table given below.

Size of Wire	Max. number of wires in	
	20mm conduit	25mm conduit
1.5 sq. mm.	4	
2.5 sq. mm.	4	6

b. Conduit shall run along wall, floor, ceiling, on steel structures, embedded in wall, floor, for ceiling, in accordance with relevant layout drawings. The contractor shall closely co-ordinate his work with the civil contractor. Exposed conduits shall be run in straight lines parallel to building columns, beams and walls. Unnecessary bends and crossings shall be avoided to present a neat appearance. In the office area as specified conduits shall be embedded along the entire run. It is the responsibility of the lighting contractor to co-ordinate with the civil contractor of these buildings.

c. Conduit shall be clamped on to approved type spacer plates or brackets by saddles or U-bolts. The spacer plates or brackets in turn, shall be securely fixed to the building steel by welding and to concrete or brick work by grouting or by nylon rawl plugs.

d. Embedded conduits shall be securely fixed in position to preclude any movement. In fixing embedded conduit, if welding or brazing is used, extreme care should be taken to avoid any injury to the inner surface of the conduit.

e. Spacing of embedded conduits shall be such as to permit flow of concrete between them and in no case shall be less then 40mm.
f. For direct embedding in soil, the conduits shall be coated with an asphalt base compound. Concrete pier or anchor shall be provided where necessary to support the conduit rigidly and to hold it in place.
g. Conduits shall be installed in such a way as to ensure against trouble from trapped condensation.
h. The contractor shall make available at site dies for threading various conduits. Running threads shall be avoided as far as practicable. Where it is unavoidable, check nut shall be used. All field thread ends shall be reamed after threading and anti-corrosive paint applied.
i. Conduits shall be kept, wherever possible, at least 300 mm away from hot pipes, heating devices etc.
j. Slip joints shall be provided when conduits cross structural expansion joints or where long run of exposed conduits are installed, so that temperature change will cause no distortion due to expansion or contraction of conduit run
k. For long conduit runs junction/ pull boxes shall be provided at suitable intervals (not exceeding 10 m) to facilitate wiring.
l. Conduits shall be securely terminated at LPs/ junction boxes or lighting fixtures by proper fastening with a lock put on inside and outside. The number of conduits terminating at LP's shall not exceed the permissible number considering the glanding area of lighting panel. Conduit terminations shall be made water & vermin proof.
m. Conduits lengths shall be jointed by acrewed couplers. Conduit shall be cleanly cut. The cut ends shall be within three (3) degrees of square with the conduit axis. Cut ends shall be reamed and all burrs and sharp edges removed.
n. Conduits lengths shall be jointed connection and shall be made thoroughly water-tight and rust-proof by application of a thread compound which will not insulate the joints. White lead will be uses for embedded conduit and red lead for exposed conduit.
o. Water treatment plant chlorination plant lighting installations shall be made with epoxy coated steel conduits and accessories.
p. Field bends shall have a minimum radius of four (4) times the conduit diameter. All bends shall be free of kinks, indentations or flattened surfaces. Heat shall not be applied in making any conduct bend. Separate bends may be sued for this purpose.
q. The entire metallic conduit system, whether embedded or exposed, shall be electrically continuous and thoroughly grounded where slip joints used, suitable bending shall be provided around the joint to ensure a continuous ground circuit.
r. Conduits and fittings shall be properly protected during construction period against mechanical injury. Conduit ends shall be plugged or capped to prevent entry of foreign material.
s. After installation, the conduits shall be thoroughly cleaned by compressed air before pulling in the wire.
t. Lighting fixtures shall not be suspended directly from the junction box in the main conduit run.
u. Conduits in control room, service building, laboratory building and other air-conditioned areas will be surface mounted on the roof above false ceiling, however vertical drops of conduits will be concealed along walls and finally plastered by bidder (including minor chipping works) for better aesthetics.

2.28.7 Lighting wires

a. Lighting wires from lighting panels to junction boxes and junction boxes to lighting fixtures, switch boxes and receptacle boxes shall run in conduits (Rigid/flexible).
b. All wires in a conduit shall be drawn simultaneously. No subsequent drawing is permissible.
c. Wires shall not be pulled through more than two equivalent 90 deg. bends in a single conduit run. Wherever required, suitable conduit junction boxes/pull boxes shall be provided. All types of wiring, concealed or unconcealed shall be capable of easy inspection.

d. Receptacles and lighting circuits shall be fed from different circuits. The switch controlling these circuits shall be on the live side (phase wire) of the circuits.
e. A.C. normal, A.C. emergency and D.C. emergency system wiring shall run throughout in separate conduits.
f. Wiring shall be spliced only at junction boxes. Maximum two wires shall be connected at each terminal.
g. In vertical run of wires in conduit the wires shall be suitably supported by means of wooden/hard rubber plugs at each pull/junction box.
h. All lighting wires shall be crimped using suitable type of solderless, crimping, tinned fork type copper lugs. Cost of the lugs shall be included in the erection price of wire.

2.28.8 Junction Boxes

a. Necessary holes for conduit/ cable entry shall be done during installation depending on the requirement. The holes shall be drilled/punched neatly and shall be dust/vermin proof after installation of the conduit.
b. All welds, bolts holes, conduit entry holes etc., made during installation as mentioned above shall be wire brushed and touched up with metal primer (lead oxide and zinc chromate in synthetic medium

2.28.9 Street Lighting/ Flood Lighting Poles

a. The lighting poles shall be erected by the contractor at locations shown in the street lighting layout. The erection work shall include making of foundations (with supply of all materials). Installation of necessary wiring/ cabling, junction/ switch box and mounting of assembled fittings All the above erection work shall be done by contractor for lighting masks including making of foundations.
b. The lighting poles shall be painted with two coats of aluminium paint after completion of installation or as specified by purchaser.
c. The flood light fixtures shall be mounted on galvanised M.S. base making use of shop drilled holes or by suitable clamps. No cutting or drilling of galvanised structure is permitted.
d. The bidder shall submit the foundation drawings of poles for purchaser's approval., if required

2.28.10 Earthing of Lighting system

a. All junction boxes, receptacles, switch boxes, lighting fixtures, conduit etc. shall be earthed in compliance with the provision of I.E. rules and applicable Indian Standard amended up to date or as specified in the approved Drawing by PEM
b. A continuous earth conductor of G.I. wire shall be run all along each conduit run and bonded at every 600 mm by not less than two turns of the same size of wires. This conductor shall be connected to the earth bus of lighting panel from which the conduits originate. All junction boxes, receptacles, lighting fixtures etc. shall be connected to this GI earth conductor. All lighting panels and LDBs shall be earthed by GI flats to the purchasers earthing bus. The supply of GI flat and erection shall be in contractor's scope and rates of the same shall be included in the erection rates of the respective LDB/LP.

2.28.11 Ceiling Fans and Regulators (If Applicable)

a. The contractor shall install the ceiling fans and regulators at the locations shown in the relevant drawings. The exact location will however, be decided at site in consultation with engineer-in-charge.
b. The fan regulators shall be flush mounted on the lighting control switch boxes provided in that area.
c. Hook along with rubber bush shall be supplied and grouted by contractor in ceiling for mounting the fan. All necessary material and hard wares for installation shall be supplied by contractor.

2.28.12 Foundation & Civil Works

a. Equipment foundations, for street lighting Poles/Flood Lighting Poles, street lighting panel and other panels mounting foundation and other civil work including supply of cement, steel and other materials as per relevant drawings and specification clauses shall be provided by the contractor. Cost of foundation works, including supply of necessary material is to be quoted as part of E & C rates for these items.
b. All foundation drawings shall be subject to the purchaser's approval. However, it shall be the responsibility of the contractor to check these foundations before commencement of erection to ensure their suitability.
c. All final adjustment of foundation levels, chipping and dressing of foundation surfaces, setting and grouting of anchor bolts, sills, inserts and fastening devices shall be carried out by the contractor including minor modification of civil work as may be required for erection.
d. Any cutting of masonry/ concrete work, which is necessary, shall be done by the contractor at his own cost and shall be made good to match the original work. The contractor shall obtain approval of the purchaser before proceeding with any cutting of masonry/concrete work.
e. The contractor shall perform all excavation and backfilling as required for ground connections and casting foundations.
f. Excavation shall be performed up to the required depth. Such measures shall be taken as may be necessary for protection of the wall.
g. The contractor shall make use of his own arrangements for pumping out any water that may be accumulated in the excavation.
h. All excavation shall be backfilled to the original level with good consolidation.
i. Re-work/Re-erection work includes removal of defective items shall be processed on unit rate as mentioned in BOQ.

2.28.13 SUPPORT TO OTHER VENDORS

a. The vendor within the quoted rates will extend certain facilities and support to other vendors (like vendor for Erection and Commissioning of Public Address, Telephone, Air-conditioning etc.).
b. Transportation assistance of the materials from BHEL stores to the intended locations, lifting facilities (cranes), supervision during erection, supervision during commissioning and other co-ordination.

~~2.28.14 FIRE DETECTION & ALARM SYSTEM~~

~~a. Fire Analogue addressable type Fire Alarm System consisting of Multi sensor type detectors, Linear Heat Sensing Cable (LHSC) detector, cabling, junction boxes, instrumentation, Fire Alarm cum control panels, repeater panels, etc.~~
~~b. All MCC / switch gear room / Control room shall be provided with Multisensor type detectors.~~
~~c. All Conveyors and Cable Galleries shall be provided with Linear Heat Sensing Cable detectors.~~
~~d. All cable galleries shall be provided with Multisensor type detector.~~
~~e. The complete Fire Detection and Protection Systems shall be as per the guidelines/ codes/standards / rules of TAC/ NFPA / IS: 3034 / OISD etc. and all the systems, equipment's and installation shall be got approved from TAC accredited professional(s) India. Customer M/s NTPC will make arrangement of TAC approved agency for accreditation of work. The contractor has to facilitate TAC for getting approval. As per TAC any modification or re erection of any item should be done and same should be carried by contractor with in quoted rates. There is no extra payment will be paid.~~

2.28.15 TREFOIL CLAMP

As per this tender, suitable trefoil clamps shall be supplied by the BHEL as quantities mentioned in the BOQ.

~~2.28.16 BATTERY/ BATTERY CHARGER~~

~~a. Lead Acid/Ni Cd (or similar type) Batteries will be supplied loose along with battery interconnection in the series/ parallel links/ bus bar, lugs, steel/ wooden battery stand either assembled or knocked down condition, cables and associated charger.~~

b. Battery charging/ discharging is a continuous process and skilled manpower shall be deployed by the contractor round the clock.
c. Contractor shall arrange suitable load, cables, safety equipment and consumables for discharging the battery during charging and discharging cycle at his cost.
d. Contractor shall provide skilled manpower for periodic maintenance after the battery are fully charged for the activities such as checking of electrolyte level, specific gravity, topping up with distilled water and cleaning till the set is handed over to customer and record of the same shall be maintained and submitted before handing over of the system.

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
1.1	**ESTABLISHMENT**			
1.1.1	**FOR CONSTRUCTION PURPOSE:**			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipment, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc.		Yes	
f	Firefighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
1.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
a	Open space for labour colony (as per availability)		Yes	Agency has to make his own arrangement at his own cost.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
1.1.3	**ELECTRICITY**			
a	**Electricity for construction purposes** of Voltage 415/440 V	Yes		Chargeable. The charges for the fixed & actual energy consumed by the Contractor shall be Recovered by BHEL based on the prevalent rate of DISCOM
b	Single point source	Yes		Chargeable. The charges for the fixed and actual energy consumed by the Contractor shall be Recovered by BHEL based on the prevalent rate of DISCOM
c	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
d	Duties and deposits including statutory clearances if applicable		Yes	
1.1.4	**Electricity for the office, stores, canteen etc of the bidder**	Yes		Chargeable.

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
a	Single point source	Yes		At a distance of 500m from site (Distance is only tentative, it may vary upto an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
1.1.5	**Electricity for living accommodation of the bidder's staff, engineers, supervisors etc**		Yes	
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
1.2.0	**WATER SUPPLY**			
1.2.1	**For Construction purposes:**			Contractor shall make all arrangements himself for supply of construction water as well as potable water for labour and other personnel at the work site/ colony. However, drawl of construction/potable water from bore-well shall be permitted if found suitable. Any statutory clearance required shall be obtained by the contractor.
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.2.2	**Water supply for bidder's office, stores, canteen etc**			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.2.3	**Water supply for Living Purpose**			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.3.0	**LIGHTING**			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	

S. No.	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	Bidder	
1.4.0	COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER			
a	Telephone, fax, internet, intranet, e-mail etc		Yes	
1.5.0	COMPRESSED AIR wherever required for the work		Yes	
1.7.0	Demobilization of all the above facilities		Yes	
1.8.0	TRANSPORTATION			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

3.1 Electricity:

3.1..1 The construction power (415V) will be provided at a single point for construction purpose only at chargeable basis and the further distribution is to be arranged by the bidder at his cost. Construction power shall be provided from the nearest Substation / tapping point.

3.1..2 Any duty, deposit involved in getting the Electricity shall be borne by the bidder. As regards to contractor's office shed also, all such expenditure shall be borne by the contractor.

3.1..3 Provision of distribution of electrical power from the given single central common point to the required places with proper distribution boards, approved cables and cable laying including supply of all materials like cables, switch boards, pipes etc., observing the safety rules laid down by electrical authority of the State / BHEL / their customer with appropriate statutory requirements shall be the responsibility of the tenderer / contractor.

3.1..4 BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage / frequency or interruptions in power supply.

3.1..5 Necessary "Capacitor Banks" to improve the Power factor shall be provided by the contractor at his cost. Penalty if any levied by customer on this account will be recovered from contractor's bills.

3.2 Tentative List of Major T&P to be deployed by the Contractor

1.0	T&P DEPLOYED BY CONTRACTOR		
S. No.	EQUIPMENT	Capacity	Qty.
1.	Trailer along with pulling unit	APR	APR
2.	Mobile Crane	upto 40T	APR
3.	Hydraulic jacks	APR	APR
4.	Copper tube bender and cutter sizes 6mm, 8mm, 1/2", 1/4"	APR	APR
5.	Oil filtration machine and tank	APR	APR
6.	Transformer oil testing kit	APR	APR
7.	Welding sets with accessories and ovens for welding electrodes backing and holding	APR	APR
8.	Pipe bending machine – 2" size	APR	APR
9.	Dye sets for threading upto 2" pipe.	APR	APR
10.	Tap sets for both BSP and NPT threads upto 1" each	APR	APR
11.	Crimping tools up to all size of cables under scope of work	APR	APR
12.	Hydraulic crimping tool	APR	APR
13.	Vacuum Cleaner (Industrial)	APR	APR
14.	Grinding Machine	APR	APR
15.	Drilling Machines	APR	APR
16.	Electric Winches	APR	APR
17.	Phase sequence indicator	APR	APR
18.	Digital Multimeters 3½ digit of reputed make	APR	APR
19.	Digital ,6 ½, 41/2 digit Motwane/HIL/Fluke	APR	APR
20.	Analog multimeters	APR	APR
21.	250V/500V/1000/5000V rated Hand operated megger Mains/battery operated	APR	APR
22.	Digital Megger	APR	APR
23.	Insulation tester mains operated 2500/5000V	APR	APR
24.	Earth resistance tester	APR	APR
25.	HV Test Kit	APR	APR
26.	Wheatstone bridge	APR	APR
27.	Micro ohmmeter	APR	APR

28.	Tong Testers AC 5/10,25/60/300 ,Amp Range ,of reputed make	APR	APR
29.	Tong Testers DC 30/60/300 A	APR	APR
30.	Stop watch	APR	APR
31.	Tele talk 2 wire system	APR	APR
32.	Torque wrench(12-60 Nm,50-225 Nm)	APR	APR
33.	Ferrule printing machine	APR	APR
34.	Dial gauges	APR	
35.	Dead Weight Tester rated 400 Kg/cm2 with weights & test gauge facility	APR	APR
36.	Oil temperature bath suitable to calibrate the instruments range 0-300 deg. C with standard temp. gauges & thermostatic control	APR	APR
37.	Standard gauges 12" dial size make	APR	APR
38.	A) 0-1 kg/cm2 pressure gauge (vacuum gauge) B) 0 – 5 or 6 kg/cm2 pressure gauge C) 0 – 10 kg/cm2 – do – D) 0 – 25 kg/cm2 – do – E) 0 – 60 kg/cm2 – do – F) 0 – 100 kg/cm2 –do – G) 0 – 250 kg/cm2 – do – H) 0 – 600 kg/cm2 – do – I) 0.2 to 1 kg -- do --	APR	APR
39.	Manometers (+/-) 1000 mm water column With hand bulb for lab and small manometers for field purpose.	APR	APR
40.	Manometer (+/-) 500mm mercury column with hand bulb for lab and small manometer for field purpose.	APR	APR
41.	Inclined manometer (+/-) 300 mm water column	APR	APR
42.	Portable air compressor with drier and regulator rated for 7 to 10 kg/cm2	APR	APR
43.	Vacuum pump	APR	APR
44.	Standard milliamps / millivolts source of reputed make. Range 0to 50 ma and 0 to 100 mv	APR	APR
45.	DC power supply 0-50 VDC, 5 A make "Aplab" or equivalent (variable source)	APR	APR
46.	Single phase variac 250 V, 8 amp	APR	APR
47.	3 phase variac rating 5 amps	APR	APR

48.	Glass thermometer 0-120 deg. C, 0-200 deg.C and 0- 600 deg.C	APR	APR
49.	Primary current injection kit	APR	APR
50.	Secondary current injection kit up to 300 amp	APR	APR
51.	DC shunt 400 amp 75 mv	APR	APR
52.	Digital Tachometer non-contact type 0 to 4000 rpm	APR	APR
53.	Decade resistance box	APR	APR
54.	Relay testing kit	APR	APR
55.	DC Ammeter	APR	APR
56.	DC Voltmeter	APR	APR
57.	Voltmeter AC	APR	APR
58.	Ammeter AC	APR	APR
59.	Oil specific gravity and PPM measuring equipment	APR	APR
60.	Dew point measurement instrument	APR	APR
61.	Oscilloscope	APR	APR
62.	Electric blower	APR	APR
63.	Equipment and consumables for LPI/MPI test on impulse pipes	APR	APR
64.	Three phase distribution board with complete setup for drawl & distribution of construction power	APR	APR
65.	Electric cables for drawl & distribution of construction power, heating machines	APR	APR
66.	Dewatering pump	APR	APR
67	Winding resistance kit (Dry type transformer with accuracy of 0.1% and 0-100 amps range)	APR	APR
68	Fork Lifter for panel/equipment handling	APR	APR
69	Sky climber	APR	APR
NOTES:			
1	The above list is only indicative and these T&Ps may not be required for entire contract period but contractor shall ensure the availability of the T&Ps as per work requirement and T&P Deployment schedule. T&P Deployment schedule shall be finalized at site in consultation with BHEL Engineer based on the work fronts/work requirement. BHEL decision shall be final and binding regarding the T&P deployment schedule. Contractor shall mobilize / maintain the T&P's as per the deployment schedule notified time to time by BHEL Engineer.		

2	APR- Contractor has to deploy T&P, MMD, IMTE as per requirement of site and as decided by BHEL Engineer.
3	If any one of T&P mentioned above is not needed for proper execution of scope of work, provided contractor has not utilized BHEL free issued T&P for completing such work, no recovery from contractor shall be applicable.
4	Any additional item required in addition to above mentioned T&P for proper execution of scope of work, contractor has to arrange such T&P within quoted rate on the instruction of BHEL in writing in a reasonable period within two weeks from the written instruction from BHEL.
5	i.) In case deployment of T&P w.r.t requirement/schedule, is delayed or deployed for a shorter period or abnormal down time of T&P or ii) in case T&P w.r.t requirement was not deployed by the contractor as per instruction of BHEL and BHEL had to deploy either its own T&P or iii.)BHEL had to deploy the T&P from outside agency, then recovery shall be done from the contractor as under:
5.1	In case BHEL had to deploy its own T&P, hire charges of T&P applicable for outside agencies as per extant guidelines for "Hire Charges on issue of Capital Tools & Plants" shall be recovered.
5.2	In case BHEL had to deploy the T&P from outside agency, actual hiring cost plus applicable overheads shall be recovered
6	All the tools and tackles/measuring instruments shall be duly tested/calibrated and valid certificate to that effect should be submitted to BHEL site in-charge before the start of work.
7	T&P's mentioned above shall be specifically deploy as per the respective packages. However, as per work requirement and availability of T&Ps the inter use in Material Handling and Mechanical works may be permitted as per the instruction of the BHEL Engineer.
8	If the work related to T & Ps mentioned above is completed then, BHEL can release that T & P during contract period / extended period if any. However, written permission shall be taken by contractor from BHEL construction Manager for releasing the T&P.

3.3 CONSUMMABLES

The supply of following materials/ consumables are to be arranged by the contractor as part of the contractual scope.

S. No.	Description
1	Welding electrodes for welding AS/CS/SS pipe and other welding from BHEL approved vendors only
2	Filler wire for argon welding
3	Argon, oxygen and acetylene gas
4	Provision for temporary scaffoldings.
5	GI "U" clamps with nuts and washers for impulse and GI pipe clamping.
6	Round aluminium tags (30mm dia. x 3mm thick)
7	Teflon tape and insulation tape.

8	Hold tight / bitumen tape for GI pipe coupling.
9	Required paints and primer from BHEL approved vendors only.
10	Solder wire (60/40)
11	Protocol/calibration report sheets as per BHEL format.
12	Panel/JB sealing compound material (for cable entry from bottom/top of panel).
13	PVC cable tie, aluminium strip and hardware for clamping of cables, copper tube, and temperature gauge capillary.
14	Copper lugs up to 4 sq. mm, PVC sleeve of different size, PVC button & tape
15	Supply of Structure Steel for station lighting as per requirement.
16	Supply of Hume pipe as per requirement
17	Spacer GI & Spacer epoxy
18	Saddle GI & Saddle Epoxy
19	Checknut GI & Checknut Epoxy
20	Inspection bend GI & Inspection bend Epoxy
21	Solid bend GI & Solid bend Epoxy
22	Circular Boxes GI & Circular Boxes Epoxy
23	Ball & Socket
24	Nylon Grips
25	Wooden Screw & Machine Screw
26	Reducer, PVC Brush & Sleeves
27	Cu Lugs , Earth Clip, Anchor Fastener , Ferrules, Flexible Coupler
28	Flexible rod & Cu clad rod for pole earthing
29	GS Flat 'U' Clamps for pole JB fixing
30	GI Bolts 'U' Clamps fixing
31	GI Conduit sleeves
32	Accessories required for handrail mounted fixture
33	GI bolts & Nuts for Fixture & CG box fixing
34	GI bolts & Nuts with washers for panels
35	Primer & Oxide paint for pole & MS structure painting
36	Aluminium paint for pole & MS structure painting
37	Double Compression Glands
38	Fan Boxes
39	Ferrules (PVC) and suitable for ferrule printing.
40	Supply & erection of consumable like conduit accessories & fittings, conduit boxes, saddles, clamps, flexible conduit, fixing hardwares, anchors, wedges, nuts & bolts, concrete inserts etc materials required for mounting the fixtures, consumable and other incidental materials required to complete the installation, testing & commissioning of complete lighting system for successful operation, & to the satisfaction of purchaser/ customer. Supply scope of these items shall form part of the installation rates quoted for the item.

NOTE: The above list is only indicative. The contractor to arrange all consumables as requirement to complete the scope of work.

List of T&P to be provided by BHEL Free of Hire Charges on sharing basis:

NIL

1.0	TIME SCHEDULE
A	Entire work shall be carried out in accordance with the broad schedule for FGD system as furnished below, within the stipulated completion period. This schedule will undergo review and based on progress vis-à-vis project requirement, contractor shall submit revised schedule for approval of BHEL/Customer M/s NTPC.

SL No.	Milestones	(Tentative Schedule) By
1	Erection Start	Jun-2025
2	Equipment Erection Completion	March-2026
3	Commissioning of FGD system	Jun-2026
4	Completion of Facilities	Sep-2026

order to meet above schedule in general, and any other intermediate targets set, to meet customer & augment all necessary resources from time to time

Above time schedule is tentative and in order to meet above schedule in general, and any other intermediate targets set, to meet customer/project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.

B. PROVISION OF PENALTY IN CASE OF SLIPPAGE OF INTERMEDIATE MILESTONES:

In case of slippage of Two Major Intermediate Milestones, mentioned as M1 & M2 hereunder, Delay Analysis shall be carried out on achievement of each of these two Intermediate Milestones in reference to F-14.

Milestones	Activities	To be completed by
M1	Equipment Erection Completion	March-2026
M2	Commissioning of FGD system	Sep-2026

Notes:

1. **Refer clause no 7 of IMPORTANT INFORMATION of the NIT** regarding modalities against provision of penalty in case of slippage of Intermediate Milestones.
2. In order to meet above schedule in general, and any other intermediate targets set, to meet customer/project schedule, contractor shall arrange & augment all necessary resources from time to time as per the instructions of BHEL.
3. In case the activities in the schedule are to be advanced, the related structural activities in the scope of the contractor are to be advanced to meet the project requirement. No extra payment whatsoever shall be paid on this account.
4. The contractor shall submit area-wise L3 schedule within 7 days in consultation with BHEL. The detailed L3 schedule shall be approved by BHEL and same shall be implemented. Bidder shall submit L3 schedule in MS Projects to meet the agreed project schedule covering various mile stone activities and their split up details such as mobilization, procurement of materials, fabrication & erection activities. This schedule shall also clearly indicate the interface facilities / inputs applicable in each package.

5. **The Contract period shall be 15 months from the date of commencement of work at site.** Erection, Testing, Calibration and Commissioning of permanent equipment required for completion of system shall be completed within the time schedule given above.
6. M1& M2 are the intermediate LD milestone. Milestones LD shall be applicable if the delay in achieving the milestone solely attributable to the contractor.
7. In order to meet above schedule and other intermediate targets/ activities as set by BHEL Engineer-in-charge at site & to meet customer requirements/ project schedule, contractor shall arrange all necessary resources and work force in consultation with BHEL Engineer at site to undertake works concurrently in all possible fronts as made available to contractor.
8. Contractor shall note that individual milestones as above shall be achieved as per schedule furnished above.
9. If work is not completed within contract period, the same may be extended at the discretion of BHEL as per General Condition of Contract provisions.
10. Executable Contract Value - Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of that milestone.
11. BHEL, owing to its commitment to their customer, may ask contractor to compress the total completion schedule by up to 15%. This will result in advancement of various milestones. Contractor shall plan his activities and mobilize additional resources accordingly to the satisfaction of BHEL engineer within the quoted rates.
12. The manpower, T&Ps, MMEs will be required in phases which may vary considerably depending on the requirement of important milestones, co-ordination with other agencies, co-ordination with BHEL/ BHEL's customer. It is the responsibility of the contractor to constantly keep in touch with BHEL's Engineer-in-Charge at site for planning and deployment of these resources.

C. COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

1. The contract shall commence from the date of deployment of contractor's T&P, proper site setup and start of erection of first equipment. All the above three conditions are to be fulfilled (certified by BHEL engineer) for deciding the date of commencement/start of the contract period. The contractor has to subsequently augment his resources in such a manner that daily activities shall be completed on daily basis and the entire work is completed within the time schedule/ contract period. Mobilization of contractor's resources shall be made and augmented from time to time in such a manner that the work in scope is carried out in an un-interrupted manner and major milestones of project are achieved on specified schedules.
2. The contractor shall complete all the work in the scope of this contract within the contract period.
3. Subject to availability of materials and other inputs, it is the responsibility of the contractor to carry out work to achieve the monthly progress and keep up the schedules.
4. Contractor shall draw the monthly erection program along with BHEL engineer indicating the work to be achieved and event to be completed. Once the program is drawn, he shall adhere to the same. Contractor shall plan and erect the materials as it is received at site. The monthly planned percentage shall take into consideration the material available at site before the start of the month and also any material received during the month. Contractor shall mobilize his resources required to achieve the monthly programs.
5. In order to meet above schedule, and any other intermediate Schedule/ targets as set by BHEL/ Customer, to meet customer and project schedule requirements, Contractor shall make the note of above and will mobilize his manpower and resources. Contractor shall meet the above schedule / Intermediate targets as set by BHEL Engineer/ Customer at site and contractor shall augment the manpower/ resources accordingly within the quoted price without any compensation.
6. Contractor shall specifically note that there is likely to be some delay in supplies of materials/ release of work fronts/ other reasons. Contractor shall have to work round the clock on such critical activities as a part of catch up program to meet the project

requirement to the extent possible and shall also provide required resources as part of scope of work.

D DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will be deemed to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

E MATERIAL RE-CONCILIATION

The contractor shall do material re-conciliation periodically.

TERMS OF PAYMENT FOR ELECTRICAL WORKS (90%)		
S. No.	Activity/ Work Description	%age of Unit Rate
E	PRO RATA PAYMENTS (90%)	
~~1.0~~	~~Cable tray and accessories~~	-
~~1.1~~	~~Fabrication and fixing/ welding/ bolting in position~~	~~75%~~
~~1.2~~	~~Earthing of cable trays~~	~~5%~~
~~1.3~~	~~Numbering of cable trays~~	~~5%~~
~~1.4~~	~~Covering of trays where ever envisaged~~	~~5%~~
-	~~Total =~~	~~90%~~
2.0	Cable laying including Earth wires	
2.1	Laying of cables/ wires	65%
2.2	Glanding & Termination (Except HT Termination) & Testing	10%
2.3	Charging of cables	5%
2.4	Dressing and clamping of cables	10%
	Total =	90%
3.0	Junction box/ Push button station (local)	
3.1	Erection including fixing of terminal blocks where ever applicable	80%
3.2	Name plate fixing where ever applicable, Labelling (both inside and outside) and Commissioning of connected equipment	10%
	Total =	90%
4.0	Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.	
4.1	Fabrication/Pre assembly/Erection, Alignment, welding/bolting and if applicable chipping/grouting/painting	90%
	Total =	90%
5.0	DG sets/ Switch Gears/ MCC/ PCC/ Distribution Boards/ Marshalling Box/ Starter Units/ Dry Transformers/ Electrical Hoists/ Panels/ Cubicles/ Desks/ UPS/ Batteries/ Chargers/ VFD/ LA assy/ NGT/ NGR/ SP/ Miscellaneous Equipment/ etc.	
5.1	Placement, Alignment and coupling/interconnection where ever applicable, erection of associated accessories etc.	50%
5.2	Pre-commissioning checks and tests	25%
5.3	Charging, Loop testing and commissioning	5%
5.4	Nomenclature/Name-plate/Painting etc	5%
5.5	System commissioning	5%
	Total =	90%
6.0	Earthing/ Lightning protection strips, Earthing pits	
6.1	Fabrication, erection, alignment, welding/ bolting of earthing/ lightning protection strips; earth pits completion	80%
6.2	Testing/commissioning/Connection to equipment	10%
	Total =	90%
7.0	LT/ HT Bus Ducts	
7.1	Pre assembly of Bus Ducts and accessories, erection, alignment, bolting/ welding etc. complete with supporting structure	70%
7.2	Pre commissioning checks	10%
7.3	Testing, Charging and Painting (as applicable)	10%
	Total =	90%
8.0	Oil Filled Transformers (Generator, Station, UAT, Station Service etc.)	
8.1	Placement on foundation and alignment	25%

8.2	Erection of associated auxiliaries/ assemblies, oil filling, etc.	30%
8.3	Dry out including oil filtration	20%
8.4	Pre-commissioning checks/Testing	10%
8.5	Charging and Painting (as applicable)	5%
	Total =	**90%**
9.0	**Testing/ Commissioning of Equipment (like motors, actuators, ESP transformer, misc. equipment, etc.) erected by other agencies**	
9.1	Testing & pre-commissioing checks	70%
9.2	System commissioning	20%
	Total =	**90%**
10.0	**HT termination/Straight through jointing kits**	
10.1	Kit termination	65%
10.2	Testing	15%
10.3	Charging	10%
10.4	Termination, HT Termination, Straight through jointing etc. : on pro rata basis	**90%**

TERMS OF PAYMENT FOR C&I WORKS (90%)		
S. No.	**Activity/ Work Description**	**% of Unit Rate**
	Main E&C Equipment/ Items	
I	**PRO RATA PAYMENTS (90%)**	
~~1.0~~	~~Cable tray and accessories~~	-
~~1.1~~	~~Fabrication and fixing/ welding/ bolting in position~~	~~85%~~
~~1.2~~	~~Covering of trays where ever envisaged~~	~~5%~~
-	~~**Total =**~~	~~**90%**~~
2.0	**Cable laying**	
2.1	Laying of Cables/Wires	60%
2.2	Glanding, Termination and Testing	15%
2.3	Commissioning of cables	5%
2.4	Dressing & Clamping of cables	10%
	Total =	**90%**
3.0	**Junction box/ Push button station (local)**	
3.1	Erection including fixing of terminal blocks where ever applicable	80%
3.2	Name plate fixing where ever applicable, Labelling (both inside and outside),Earthing and Commissioning of connected equipment	10%
	Total =	**90%**
4.0	**Conduits/ impulse pipe/ tubes**	
4.1	Fabrication, Laying and Erection	65%
4.2	Leak Test/ Hydraulic Test (where ever applicable, otherwise clubbed with next activity)	10%
4.3	Dressing, clamping, tagging and painting where ever applicable	8%
4.4	Testing & commissioning of associated equipment/ system	7%
	Total =	**90%**

5.0	**Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.**	
5.1	Fabrication/Pre assembly/Erection, Alignment, welding/bolting and if applicable chipping/grouting/painting	90%
	Total =	**90%**
6.0	**Panels/ Cubicles/ Desks/ Racks/ Enclosures/ Monitors/ Computers/ Computer peripherals/ PLCs/ UPS/ Batteries**	
6.1	Erection and alignment	65%
6.2	Fixing of loose items/ instruments where ever applicable	10%
6.3	Pre commissioning checks, Charging of panel and Loop testing etc.	10%
6.4	System commissioning	5%
	Total =	**90%**
7.0	**Instruments/ Devices including Sensors/ Cells/ Probes etc.**	
7.1	Calibration/ Testing/ Pre erection checks	30%
7.2	Erection/Placement and fixing of loose items/accessories/Pre commissioning checks/loop testing/Simulation testing as required	50%
7.3	Remote/ local commissioning as required	10%
	Total =	**90%**
8.0	**Commissioning and Testing activities for Equipment erected by other agencies, like control valves, on/ off valves, electrical/ pneumatic valves, actuators, solenoid valves, valves, limit switches, ERV controllers, power cylinders, Pressure & Temperature Gauges/ Transmitters, etc.**	
8.1	Removal & re-fixing/Fixing loose supplied components, including tubing/hose, regulators, etc.(where ever applicable, otherwise clubbed with next activity)	35%
8.2	Calibration/ Local testing - commissioning readiness	30%
8.3	Local Commissioning & Loop Testing as required	15%
8.4	System Commissioning or Remote Commissioning as required	10%
	Total =	**90%**
9.0	**Miscellaneous items (items not covered under above heads)**	
10.1	Erection	50%
10.2	Alignment	15%
10.3	Testing	15%
10.4	Completion	10%
	Total =	**90%**

The progressive payment for erection, testing and commissioning on accepted price of contract value for C&I & Electrical Package rates will be released as per the break up given hereunder:

Note: Payment shall be made on actual basis as per the work executed at site measured and certified by BHEL engineer.

II	**STAGE/ MILESTONE PAYMENTS (10%)**	
1	Trial run of FGD System	3%
2	Trial Operation of Unit	3%
3	Punch List points/ pending points liquidation	1%

4	Area cleaning, temporary structures cutting/ removal and return of scrap	1%
5	Submission of 'As Built Drawings'	1%
6	Material Reconciliation	1%
	Total for Stage/ Milestone Payments (10%)	**10%**

Note: Payment shall be made on actual basis as per the work executed at site measured and certified by BHEL engineer.

8.0 TAXES, DUTIES, LEVIES (Rev 14 dated 09/10/2020)

1. All taxes excluding GST, GST Cess **& BOCW** Cess **but including, Royalties, fees, license, deposits, commission, any State or Central Levy and other charges whatsoever, if any, shall be borne by you and shall not be payable extra.**
2. Any increase of the taxes excluding GST, GST Cess & BOCW **Cess**, at any stage during execution including extension of the contract shall have to be borne by the contractor. Quoted/ accepted rates/ price shall be inclusive of all such requirements. Please note that since GST on output will be paid by BHEL separately as enumerated below, your quoted rates/ price should be after considering the Input Credit under GST law at your end.
3. **GST :**

   The successful bidder shall furnish proof of GST registration .GST along with Cess (as applicable) legally leviable & payable by the successful bidder as per GST Law, shall be paid by BHEL. Hence Bidder shall not include GST along with Cess (as applicable) in their quoted price.
4. GST charged in the Tax Invoice/Debit note by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. E-invoicing under GST has been implemented with effect from 1st October 2020 for all the taxable persons having turnover more than the threshold limit in any preceding financial year from 2017-18 onwards. Therefore, for all the taxable persons falling under the purview of E-invoice, it is mandatory to mention a valid unique Invoice Reference No. (IRN) and QR code as generated from E-Invoicing portal of the Government for the purpose of issuing a valid Tax Invoice. Only an E-invoice issued in the manner prescribed under rule 48(4) of CGST Rules shall be treated as valid invoice for reimbursement of GST amount.

   If the successful Bidder is not falling under the purview of E-Invoicing then he has to submit a declaration in that respect along with relevant financial statements.
6. Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred there under) wherein the 'Bill To' details will as below:

   BHEL GSTN – As per **Annexure -1**

   NAME -- Bharat Heavy Electricals Limited

   ADDRESS – Site address
7. Bidder to immediately intimate on the day of removal of Goods (in case of any supply of goods) to BHEL along with all relevant details and a scanned copy of Tax Invoice to below email ids to enable BHEL to meet its GST related compliances :-

   Email id ---- to be intimated later on.

   In case of delay in submission of the abovementioned documents on the date of dispatch, BHEL may incur penalty /interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from the successful bidder, if such delay is not attributable to BHEL.
8. In case of raising any Supplementary Tax Invoice (Debit / Credit Note) Bidder shall issue the same containing all the details as referred to in Section 34 read with Rule 53.
9. Bidder shall note that in case GST credit is delayed/ denied to BHEL due to delayed / non receipt of goods and /or tax invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be

recoverable from the vendor along with interest levied / leviable on BHEL, as the case may be.

10. Bidder shall upload the Invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law , GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the bidder along with interest levied / leviable on BHEL.
11. Way Bill: Successful Bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract.

    The Bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit/ Way Bill, if required, shall be arranged by the contractor and BHEL will not supply any Road Permit/ Way Bill for this purpose.
12. New taxes and duties:-Any New taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period including extension, if the same is not attributable to you, shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
    Benefits and/or abolition of all existing taxes must be passed on to BHEL against new Taxes, if any, proposed to be introduced at a later date.
    In case any new tax/levy/duty etc. becomes applicable after the date of bidder's offer but before opening of the price bid, the bidder must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of the price bids. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

13. For transportation work, bidder shall declare in his quotation whether he is registered under GST, if yes, whether he intends to claim GST on forward charge basis. In absence of this declaration, BHEL will proceed further with the assumption that bidder intends not to claim GST on forward charge basis. However, in case of GST registered transporter, the amount to the extent of goods and service tax will be retained till BHEL avails the credit of GST. Further, transporter shall issue tax invoice which inter alia includes gross weight of the consignment, name of the consigner and the consignee, registration number of vehicle in which the goods are transported, details of goods transported, details of place of origin and destination, GSTIN of the person liable for paying tax whether as consigner, consignee or goods transport agency, and also containing other information as mentioned under rule 46.

14. **TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills unless exemption certificate from the appropriate authority/ authorities is furnished.**

15. **TDS under GST shall be deducted at prevailing rates on applicable value from the running bills.**

16. **TCS under Income Tax 1961 has been implemented with effect from 1st October 2020 for every seller having turnover more than threshold limit during financial year immediately**

preceding financial year in which the sale of goods is carried out, who receives any amount as consideration for sale of any goods of the value or aggregate of such value exceeding threshold limit other than export of goods or who is already covered under other provision of section 206C, collect from the buyer, TCS as per applicable rates of the sale consideration exceeding threshold limit subject to following conditions

i. Buyer shall be as per clause (a) of section 206C- (1H)
ii. Seller shall be as per clause (b) of section 206C- (1H)
iii. No TCS is to be collected, if the seller is liable to collect TCS under other provision of section 206C or the buyer is liable to deduct TDS under any provision of the Act and has deducted such amount.

If Successful Bidder is falling under the purview of TCS then he has to submit a declaration in that respect along with relevant financial statements before the start of work or if bidder is falling under preview of TCS during the work in progress then bidder is compulsorily required to submit relevant financial statement in the beginning of the respective FY.

For TCS claim, vendor has to submit relevant documents required as per Income Tax Act.

17. Refer Annexure – 2 for BOCW Act & Cess Act.

ANNEXURE-1

State wise GSTIN no.s of BHEL

Sl. No	Projects under state	GSTIN
1	Andhra Pradesh	37AAACB4146P7Z8
2	Bihar	10AAACB4146P1ZU
3	Chhattisgarh	22AAACB4146P1ZP
4	Gujarat	24AAACB4146P1ZL
5	Jharkhand	20AAACB4146P5ZP
6	Madhya Pradesh	23AAACB4146P1ZN
7	Maharashtra	27AAACB4146P1ZF
8	Orissa	21AAACB4146P1ZR
9	Telangana	36AAACB4146P1ZG

ANNEXURE-2

BOCW Act & Cess Act

Bidder may please note that the sub-contractor/bidder of BHEL engaging building or construction worker in connection with building or other construction work, are required to follow the procedures enumerated below:

1. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
2. It shall be sole responsibility of the contractor engaging Building Workers in connection with the building or other construction works in the capacity of employer to apply and obtain registration certificate specifying the scope of work under the relevant provisions of the Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 from the appropriate Authorities.
3. It shall be responsibility of the contractor to furnish a copy of such Registration Certificate within a period of one month from the date of commencement of Work.

4. It is responsibility of the contractor to register under the Building and other Construction Workers' Welfare Cess Act, 1996 and deposit the required Cess for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 at such rate as the Central Government may , by notification in the Official Gazette, from time to time specify. However, before registering and deposit of Cess under the Building and other Construction Workers' Welfare Cess Act, 1996, the contractor will seek written prior approval from the Construction Manager.
5. It shall be sole responsibility of the contractor as employer to get registered every Building Worker, who is between the age of 18 to 60 years of age and who has been engaged in any building or other construction work for not less than ninety days during the preceding twelve months as Beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996.
6. It shall be sole responsibility of the contractor as employer to maintain all the registers, records, notices and submit returns under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.
7. It shall be sole responsibility of the contractor as employer to provide notice of poisoning or occupation notifiable diseases, to report of accident and dangerous occurrences to the concerned authorities under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the rules made thereunder and to make payment of all statutory payments & compensation under the Employees' Compensation Act, 1923.
8. It shall be the responsibility of the sub-contractor as employer to make payment/deposit of applicable cess amount on the extent of work involving building or construction workers engaged by the sub-contractor within a period of one month from the receipt of payment. It shall also be responsibility of the Contractor to furnish BHEL on monthly basis, Receipts/ Challans towards Deposit of the Cess under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder along with following statistics :
   (i)Number of Building Workers employed during preceding one month.
   (ii) Number of Building workers registered as Beneficiary during preceding one month.
   (iii)Disbursement of Wages made to the Building Workers for preceding wage month.
   (iv) Remittance of Contribution of Beneficiaries made during the preceding month
9. BHEL shall reimburse the contractor the Cess amount deposited for the purposes of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 under the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder. However, BHEL shall not reimburse the Fee paid towards the registration of establishment, fees paid towards registration of Beneficiaries and Contribution of Beneficiaries remitted.
10. It shall be responsibility of the Building Worker engaged by the Contractor and registered as a beneficiary under the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 to contribute to the Fund at such rate per mensem as may be specified by the State government by notification in the Official Gazette. Where such beneficiary authorizes the contractor being his employer to deduct his contribution from his monthly wages and to remit the same, the contractor shall remit such contribution to the Building and other construction Workers' Welfare Board in such manner as may be directed by the Board , within the fifteen days from such deduction.
11. Bidders may please note that though the quoted price is exclusive of BOCW (which will be reimbursed by BHEL as per sub-clause 9 above) , however, If at any point of time during the

contract period, non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder is observed, BHEL reserves the right to deduct the applicable cess (1%) on the contract value and penalty (if any, imposed by Cess Authorities) from the payables on account of non-compliance.

12. The contractor shall declare to undertake any liability or claim arising out of employment of building workers and shall indemnify BHEL from all consequences / liabilities / penalties in case of non-compliance of the provisions of the Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and the Building and other Construction Workers' Welfare Cess Act, 1996 and the rules made thereunder.

9.1 SPECIFIC INCLUSIONS

SPECIFIC INCLUSIONS MATRIX

S. No.	Description	Scope/ to be taken care by		Remarks
		BHEL	Bidder	
1	Lugs up to 4 sq. mm size	-	Yes	
2	Lugs beyond 4 sq. mm size	Yes	-	For GI wire earthing
3	Paint, primer and consumables		Yes	
4	LT cable straight through jointing Kits		Yes	
5	HT Termination Kits	Yes	-	
6	Clamps with hardware (Trefoil explicitly mentioned in BOQ)	Yes	-	For single core HT cable
7	Clamps with hardware		Yes	As per requirement for LT cables
8	Identification tags/ name plates with, PVC/ metals, sleeve and clamps with hardware for cables at both end and field instruments. PVC ties, Buttons and tap		Yes	
9	Steel for fabrication	Yes	-	
10	Cable ferruling numbers and characters.	-	Yes	
11	Cable Markers	-	Yes	

NOTE: The aforesaid inclusions should not be construed as exhaustive. They are meant for general guidelines. BHEL reserves the right to include or exclude any item which is required for completing the job as per rates indicated in rate schedule. Contractor should carry out all such jobs as per the instructions of BHEL Engineer.

10.1 SPECIFIC EXCLUSIONS

N.A.

NOTE: The aforesaid exclusions should not be construed as exhaustive. They are meant for general guideline. BHEL reserves the right to include or exclude any item which is required for completing the job as per rates indicated in rate schedule. Contractor should carry out all such jobs as per the instructions of BHEL Engineer.

SL. NO.	DESCRIPTION	UOM	Total Qty	Factor
E2	Cable Laying including Earthing Wire			
E2.A	6.6KV, Aluminium Conductor XLPE insulated power cable			
E2.A.1	3C-150 SQMM	Mtr	6600	0.02570182467740370
E2.A.2	1C-240 SQMM	Mtr	16000	0.01800057918769480
E2.B	LT POWER CABLES			
E2.B1.	3 C X240 SQ MM	Mtr	3972	0.01755994951142310
E2.B1.	3 C X150 SQ MM	Mtr	6329	0.02159174033875190
E2.B1.	3C X16 SQ MM	Mtr	2284	0.00232435658163134
E2.B1.	3 C X25 SQ MM	Mtr	1240	0.00187851824849841
E2.B1.	3 C X50 SQ MM	Mtr	3524	0.00664934939597321
E2.B1.	3 C X95 SQ MM	Mtr	660	0.00149185950706289
E2.B1.	1C X630 SQ MM	Mtr	1440	0.00384964413546620
E2.B1.	1C X300 SQ MM	Mtr	675	0.00130533360625857
E2.B1.	2C X10 SQ MM	Mtr	1713	0.00148542025370545
E2.B1.	2C X25 SQ MM	Mtr	1713	0.00162077667907517
E2.B1.	2C X50 SQ MM	Mtr	120	0.00016793689184296
E2.B1.	2C X95 SQ MM	Mtr	1743	0.00253047707910504
E2.B1.	3.5Cx25 sq mm	Mtr	4124	0.00823159789764026
E2.B1.	3.5Cx50 sq mm	Mtr	5770	0.01328015029097320
E2.B1.	3.5C x95 sq mm	Mtr	620	0.00144620441149126
E2.B1.	2C x2.5 sq mm	Mtr	45505	0.03574216750914170
E2.B1.	3C x2.5 sq mm	Mtr	17130	0.01559689601812150
E2.B1.	4C x10 sq mm	Mtr	1142	0.00126192924897185
E2.C	LT CONTROL CABLES			
E2C.1	2C x1.5 sq mm	Mtr	19037	0.01551302405117520
E2C.2	3Cx1.5 sq mm	Mtr	23000	0.01946078388012960
E2C.3	5C x1.5 sq mm	Mtr	300	0.00025393803228084
E2C.4	7C x1.5 sq mm	Mtr	4840	0.00416119334445515
E2C.5	5C x2.5 sq mm	Mtr	19640	0.01703225644632020
E2C.6	10C x1.5 sq mm	Mtr	11000	0.01199429721844670
E2C.7	12C x2.5 sq mm	Mtr	5200	0.00694327755382789
E2C.8	16C x1.5 sq mm	Mtr	14000	0.01550856950941070
E2C.9	19C x1.5 sq mm	Mtr	5000	0.00531585584655066
E2.D	INSTRUMENTATION CABLES			
E2.D.1	2P x0.5 sq mm	Mtr	11000	0.00828352562635364
E2.D.2	4P x0.5 sq mm	Mtr	68000	0.05870299703158870
E2.D.3	8P x0.5 sq mm	Mtr	34000	0.03388233158692200
E2.D.4	12Px0.5 sq mm	Mtr	8000	0.00900962137355200
E3	Junction Box/Push button station			

E3.A	**Junction Boxes**			
E3.A.1	24 way junction Box	No.	128	0.00672778269915186
E3.A.2	Power Junction Box	No.	10	0.00052083314275100
E5	**DG sets/Switch Gears/MCC/PCC/Distribution Boards/Marshalling Box/Starter Units/ Dry Transformers / Electrical Hoists/ Panels/Cubicles/Desks/UPS/ Batteries/ Chargers/VFD/ LA assy/ NGT/ NGR/ SP/Miscellaneous equipment/ etc.**			
E5B	**HT SWITCHGEAR-33 /6.6 KV SWITCHBOARD**			
E5B.1	6.6 kV switch board consists of approx. 27 panels. Approx. dimensions 22140X2900X2400 mm	Set	1	0.01659552571390570
E5B.2	6.6 kV switch board consists of approx. 20 panels. Approx. dimensions 16400X2900X2400 mm	Set	1	0.01229298201030050
E5C	**LOW VOLTAGE SWITCHGEAR**			
E5C.1	415V, FGD PMCC-0DA, (Apprx. Dimension 20200x1700x2450mm)	No.	1	0.01297082658537330
E5C.2	415V, FGD PMCC-0DC, (Apprx. Dimension 20200x1700x2450mm)	No.	1	0.01297082658537330
E5C.3	220V DCDB-1FA,(Apprx. Dimension 2400x1700x2450mm)	No.	1	0.00118722414137028
E5C.4	415V EMERGENCY MCC-0MA (Apprx. Dimension 12000x1700x2450mm)	No.	1	0.00579294718460782
E5C.5	415V GDW, CA MCC 0SA (Apprx. Dimension 14000x1500x2525mm)	No.	1	0.00579294718460782
E5C.6	415V EMERGENCY MCC-0MC, (Apprx. Dimension 12000x1700x2450mm)	No.	1	0.00579294718460782
E5D	**Dry Type Transformer**			
E5D.1	6.6/0.433KV,1600kVA,Dry type transformer,	No.	4	0.03457902261666580
E5E	**STATION Lightning**			
E5E.A	**Lighting Distribution Board (LDB)**			
E5E.A.1	100kVA transformer for housing in 1.1.1 - Normal Non encapsulated type	No.	2	0.00100343738839505
E5E.A.2	AC LDB Type LDB-F (8) without transformer (including cubicle suitable for 2 nos. 50 kVA transformer)	No.	1	0.00078625816148975
E5E.A.3	50kVA transformer for housing in 1.2 - Normal encapsulated type	No.	2	0.00146160138999521
E5E.B	**Lighting Panels (LP)**			
E5E.B.1	AC Normal /Emergency indoor Type LP – A (12) [with timer]	No.	2	0.00036161491326858
E5E.B.2	AC Normal /Emergency outdoor Type LP – A (18) [with timer]	No.	4	0.00081661651648202
E5E.B.3	Street Lighting Type LP – S (6) with energy saving system	No.	1	0.00018767910163121
E5E.C	**Lighting Luminaires (complete with accessories)**			
E5E.C.1	Industrial type LED fixture suitable for conduit /surface/ suspended mounting,	No.	9	0.00028805169421582

	with integral driver aesthetically designed for Switchgear / Equipment room (Equivalent to FC06)			
E5E.C.2	Street light LED fixture (Equivalent to SS62)	No.	12	0.00037253138716845
E5E.C.3	Well glass type, vapour proof LED fixture suitable for Boiler / ESP platforms (Equivalent to SW41)	No.	253	0.00898831587753982
E5E.C.4	Well glass type, vapour proof LED fixture suitable for Boiler / ESP platforms (Equivalent to SW42)	No.	32	0.00115375793658171
E5E.F	**Junction boxes**			
E5E.F.1	Type JB-F	No.	307	0.01625542477553810
E5E.G	**Receptacles**			
E5E.G.1	Type RA	No.	7	0.00022169314996108
E5E.G.2	Type RC	No.	4	0.00016190185122613
E5E.H	**Ceiling fans with electronic regulators**			
E5E.H.1	Pedestal Fan	No.	3	0.00004398540617824
E5E.H.2	Emergency lighting Units (With Ni-Cd battery, Charger and 2 X6 W LED lamp)	No.	4	0.00018665571551417
E5E.I	**Poles [Fabricated swaged, stell tubular with swan neck arrangement, GALVANISED]**			
E5E.I.1	Octagonal pole type PS-1 (9M) (Including foundation)	No.	20	0.00916967875976706
E5E.I.2	Octagonal pole type PF-2 (9M) (Including foundation)	No.	5	0.00190338180790076
E5E.J	**Wires**			
E5E.J.1	1x2.5 mm2 Cu PVC	Mtr	23400	0.00579898790811780
E5E.J.2	1x 4 mm2 Cu PVC	Mtr	2010	0.00053835373292161
E5E.K	**Hot dip Galvanised Rigid Steel Conduits (Heavy Duty)**			
E5E.K.1	20 mm dia GI conduit, 1.6 mm thick	Mtr	6480	0.02068846413557340
E5E.K.2	25 mm dia GI conduit, 1.6 mm thick	Mtr	1050	0.00373959698133424
E5E.K.3	20 mm dia GI conduit with epoxy coating, 1.6 mm thick	Mtr	180	0.00036427079279512
E5E.K.4	50mm dia GI conduit 2.0 mm thick	Mtr	900	0.00477129455835170
E5E.L	**Conduit/Hoses/Pipes**			
E5E.L.3	Occupancy Sensor	No.	2	0.00002251194343141
E5G	**VFD Panel**			
E5G.1	Transportation from stores / storage yards to erection site, erection, assembly, testing & commissioning of Variable Frequency Drive System for RC Pump VFD Panel (5000 x1500x 3000 mm) consisting Dry Type Transformer,Breaker Panel, MCC Panel etc	Set	8	0.05385950766469110
E7	**LT/HT BUS DUCTS**			
E7A	**SEGREGATED PHASE BUS DUCT**			
E71A.1	2000/2500A SPBD between FGD TRF TO 6.6KV SWBD	Mtr	77	0.02429634943723930
E7B	**LT Bus Duct**			

E7B.1	415 Volt LT Bus Duct . Approx.length of each bus duct -(approx 10-30 Meter).Loose items like silicagel Breather pipe,GI Channel Supports and associated accessories.	No.	2	0.00454403704882387
E8	**Oil Filled Transformer**			
E8.1	Transportation up to foundation, Assembly, testing & commissioning of Three Phase , 33/6.9 KV, 20 MVA ONAN, Outdoor transformer along with HV/LV/LVN Porcelain bushings, radiators, conservator, marshalling panel, HV Cable box with is connecting chamber, Buchholz relay, Cable box supports, PRV, piping, NGR etc., Weight 47500kg	Set	4	0.09026788093523510
E9	**ONLY TESTING & COMMISSIONING**			
E9.1	Testing and commissioning of 3.3/6.6 &11 KV HT motors including dryout.	No.	17	0.00617884211776358
E9.2	Manuel/Motor Operated Actuators	No.	16	0.00116055914215341
E9.3	Mototrised/Pneumatic Valve	No.	218	0.01952163268895750
E10	**OTHER ITEMS**			
E10A	**HT CABLE TERMINATION/JOINTING KITS (Armoured/Un-armoured)**			
E10A.1	TERM. KIT 6.6KV 3CX150 SQMM	Nos	70	0.00926641629234535
E10A.2	TERM. KIT 6.6KV 1CX240 SQMM	Nos	27	0.00396203968469753
E10A.3	JOINTING KIT 6.6KV 1CX240 SQMM	Nos	15	0.00314186294930423
E10B	**Trefoil clamps**			
E10B.1	Outer Dia 30-35	NOS	225	0.00195905779871519
E10B.2	Outer Dia 40-45	NOS	530	0.00456382778693846
E10B.3	Outer Dia 45-50	NOS	5335	0.04645143713842460
I7	**Panels/Cubicles/Racks/Enclosures/Monitors/Computer/Computer peripheral/PLCs/UPS/Batteries**			
I7.1	DCS Control Panel (suit of 04 panels) size of each Suit: 3000 x750x 2067 mm	Set	5	0.01567483799343740
I7.2	DCS Control Panel (suit of 01 panels) size of each Suit: 750 x750x 2067 mm	Set	9	0.00705367709704684
I7.3	Network Enclosure	No.	4	0.00247544857772858
I7.4	VMS Panel1500 x800x 2067 mm)	Set	2	0.00408871987622854
I7.5	LIE	Nos	40	0.03127834709309600
I7.6	Operator Station (OPS) /Engineering Activity station/Historian Station Having 24 " LED Monitor, and other loose supplied items like Key board, Mouse, Modems, UPS, inter connecting power and communication cables etc	No.	8	0.00228510669366826
I8	**Instruments/Devices including sensors/Cells/Probes etc**			
I8.1	Electronic Transmitter (Pressure & Differential pressure transmitter) with probe and all accessroies	No.	94	0.01403331895744700
I8.2	Temperature Transmitters	No.	379	0.01775916535194150

I8.3	Temperature Gauge Gas Filled Type/Temp. gauge/Temp. Element/Temp. gauge MIST (Mercury in Steel thermometer)	No.	16	0.00062673671305298
I8.4	Pressure/Differential Pressure Gauges	No.	46	0.00165556533378884
I8.5	Flow Meter	No.	23	0.00329700797153529
I8.6	PH Analyser	Set	4	0.01171226292879990
I8.7	Rotameter	No	88	0.00412350013448773
I8.8	SO2 Analyser along with probe , interconnection tubing , cabling etc.	Set	4	0.01205841020069590
I8.9	Nox/Co/Co2 Analyser	Set	2	0.00597759237415175
I8.10	Dust Analyser/Ultrasonic Flowmeter/Mercury Analyser	Set	4	0.01103845809029980
I8.11	O2 Analyser along with electronic unit & accessories.	Set	2	0.00133833824186466
I8.12	Temp/ Pressure/ DP switches	No.	2	0.00009074094330004
I8.13	Limit Switches	No.	2	0.00004869145735099
I8.14	Level transmitter/Level gauge/Level indicator	No.	16	0.00172136182510907
I8.15	Flow switches	No.	2	0.00020094734576491
TOTAL FACTOR SUM				1.000000000

Instructions to the bidders

1. **Bidders shall quote Total Lump-sum Price for the entire scope of work in Rupees in VOL II PRICE BID at BHEL E-procurement Portal.** Any other entry elsewhere in the offer of the bidder shall be treated as Null and Void. The total value including value of St No. A shall be automatically calculated on E-portal
2. This Quoted Lump-sum Price shall be distributed based on the BHEL fixed percentage weightages w.r.t the total Total Lump-sum Price quoted by the bidder for the subject tender.
3. BHEL has pre-fixed the Weightage/Factor as detailed above in this chapter for deriving the Item Rates. By multiplying BHEL pre-fixed the Weightages / Factor and the total prices derived in sl no. 2 above; item rate of individual items shall be derived. Item Rate/Item Rate thus arrived shall be rounded off to two decimal places.
4. Item Rates derived in Sl. no. 4 shall be divided by quantity of respective items to derive Unite Rates. Unit Rates thus derived shall be rounded off to two decimal places
5. **Grand Total amount for the work shall be derived by BHEL by summing up respective total amounts.**
6. **Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of work executed at the unit rate arrived at as per Sl No.4 above.**
7. For the convenience of bidders, BHEL has issued an excel sheet with all the requisite formulae as described above. ***However the referred excel sheet shall not form part of contract document. Further, this sheet should not be uploaded at the e-Portal.***